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The Mitchell Lecture

ON

TUBERCULOSIS OF THE LARYNX:

ITS SIGNIFICANCE TO THE PHYSICIAN.

Delivered before the Royal College of Physicians of London, November 6th, 1924,

BY

Sir StClair THOMSON, M.D.

It would not be an exaggeration to say that to-day, in England and Wales, there are 106,990 individuals afflicted with tuberculosis of the larynx. This figure is arrived at in the following manner: In the year 1923 the deaths from pulmonary tuberculosis amounted to 32,097.* Now, statisticians are of opinion that for every single case which succumbs during a year there are ten others still suffering from it; this gives us 320,970 as the number of consumptive invalids in one year. Of these 320,970 patients the proportion who must have a laryngeal complication is at least one in three; and so we arrive at 106,990 as a modest estimate of the number of those who, in this country to-day, require relief or cure for tuberculosis of the larynx.

Of every ten persons born one is going to die of tuberculosis, and, as a rule, he will succumb while in the prime of life. Tuberculosis is the most important disease with which humanity has to cope. There is no other specific disease so common in the larynx. As the 106,990 cases in this country to-day must look principally to the physician for guidance and help, it is well worth while considering what assistance in his task can be offered by a laryngologist who, during a period of ten years, has carefully watched the progress of 477 instances of laryngeal disease, in 2,541 patients with pulmonary tuberculosis.[1]

Proportion of Laryngeal Cases in Pulmonary Tuberculosis.

In the early years of this investigation one case out of every four had trouble in the larynx, while the average of the whole decade showed a proportion of 18.77 per cent. These patients were seen in a sanatorium and were relatively early cases, for the records of the *post-mortem* room show that the larynx is diseased in 48 to 83 per cent. of all fatal cases.

Suggestive Symptoms.—The physician would therefore be well advised to be prepared to encounter a laryngeal lesion in a considerable number of his consumptive patients. The importance of this recognition will be brought out later on. The two most suggestive symptoms to him will be—first, slight but persistent huskiness; and, secondly, discomfort referred to the throat, or even pain in swallowing. The latter is a symptom which is more frequent with advanced cases; therefore, for the all-important attainment of an early diagnosis, any hoarseness or any slight change in voice which does not clear up in two or three weeks should rouse suspicion and entail an expert examination of the larynx.

Without Change of Voice.—But we must not forget that tubercle occasionally invades the larynx without causing the slightest alteration of voice or any other local symptom. This is quite understandable if we remember that disease may be deposited in the epiglottis, on a ventricular band, or on the aryepiglottic fold without interfering with the glottis or impeding the clear vibration of the vocal cords. Of the 477 cases of laryngeal tuberculosis, I found no less than 57 (34 men and 23 women) who had no complaint of their throat, and whose voices—both to their own ear and to mine—sounded quite clear and normal. The regular physician should therefore be prepared for the possibility of a laryngeal lesion with his consumptive patients, even when they have a clear voice. The proportion is small; my 57 cases occurred in 2,541 patients—an average of only 2.2 per cent.; still, an examination of a patient with pulmonary tuberculosis—or even suspected of it—cannot be regarded as complete without a laryngeal inspection.

Proportion of Laryngeal Cases in Relation to Sex.

Since the days when changes could be diagnosed in the larynx by the aid of the laryngoscope (invented by Manuel Garcia in 1854[2]) it has been accepted that men are more prone to develop laryngeal tuberculosis than women, just as the male larynx is regarded as more disposed than the female to be attacked with any disease. It used even to be thought that the female sex was less subject than the male to contract pulmonary tuberculosis. But it has been shown that any difference between the sexes in this respect is not, as regards tubercle, due to any sexual predisposition, but simply to the fact that, until recent times, women have led a more sheltered life and have been less exposed both to fatigue and to infection than men who work in office or factory. When both sexes are exposed to the same conditions, woman is just as subject to tuberculosis (in lungs or in larynx) as man—perhaps more so. A glance at Fig. 1 will show that the difference of laryngeal disease in the two sexes is so slight that it may be disregarded. The conclusion is that, amongst bread-winners, we must be prepared to find tubercle just as frequently in the larynx of the female as of the male. Another conclusion is that man's greater indulgence in alcohol and tobacco does not seem to render his larynx more vulnerable to tuberculosis.

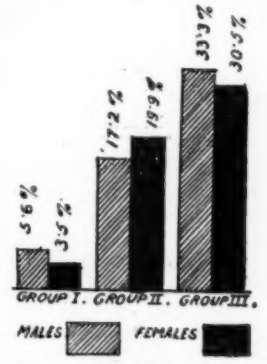

Fig. 1.—Percentage incidence of laryngeal cases in the two sexes and in the three stages of pulmonary tuberculosis.

Proportion of Laryngeal Cases in Relation to Stage of Pulmonary Disease.

It has long been established that the frequency with which the larynx is invaded increases with the progress of the pulmonary disease. This may occur even in 4.8 per cent. of cases in an early stage of the disease. These are cases with limited lesions, and, at this period, might well be called "favourable." In severe cases the proportion mounts up to 18.3 per cent.; while in the advanced type of disease, which forms Group III of the Turban-Gerhardt classification, the proportion of laryngeal disease is almost double—namely, 31.5 per cent.

An inspection of the diagram (Fig. 1) shows that both women and men are increasingly liable to a laryngeal lesion with the progress of the pulmonary disease. Only one out of every twenty *poitrinaires* with an early lesion is liable to throat trouble; in more serious cases (that is, those in Group II of the Turban-Gerhardt classification) the proportion may be one in five; and in the advanced cases of Group III one patient in every three will have the disease in the larynx. This development—as will be shown later—diminishes so markedly the prospect of recovery that it emphasizes the great importance of diagnosing pulmonary tubercle in its early stage and persuading the patient to submit to the best treatment.

Region of Larynx Attacked.

Tubercle may deposit in any part of the larynx, but it may help towards an early diagnosis of more cases if a keen look-out is kept on the region most commonly attacked. It is quite certain that the favourite site is the neighbourhood of the posterior commissure—that is, the interarytenoid area, the anterior surface of the arytenoid bodies, and the vocal processes (Fig. 2). The vocal cords come next in frequency, while the epiglottis and the region of the anterior commissure are attacked more rarely and are generally late extensions of the disease. Now, the importance of bearing this fact in mind is that it is just around the margin of the posterior commissure that the disease

* On the State of the Public Health. Annual Report of the Chief Medical Officer of the Ministry of Health for the year 1923. His Majesty's Stationery Office, London. 1924. Price 3s.

is most curable, and yet it is an area which is frequently overlooked. Reports are very commonly sent up with the remark that "the arytenoids are swollen," or that "the

Fig. 2.—Distribution of lesions in different regions of the larynx.

cords are not ulcerated." But the latter is not the most common lesion, and by the time that an arytenoid is swollen the disease is advanced and generally hopeless.

Prognosis of Tuberculosis in the Larynx.

To forecast the possible course of a lesion in the larynx requires the careful balancing of a large number of factors, general and local, and hardly comes within the scope of this lecture. What the prospect is of a local cure may be estimated by a study of the accompanying table (p. 843), which shows the results of treatment in nearly 500 cases of the disease. Of much more importance to the general physician is an appreciation of what tuberculosis in the larynx counts for in regard to the mortality of pulmonary cases.

The Prognostic Value of Tuberculosis of the Larynx in regard to Mortality.

In treatises on medicine or on pulmonary tuberculosis it is not unusual to read that, if the disease attacks the larynx, it "adds distressing features to the case," or "increases the gravity of the outlook." These statements I entirely endorse, but I hardly think it is generally realized that this complication is such a serious one—only less in gravity than a secondary invasion of the meninges—and I hope that the following observations may help to strengthen the position of the physician by encouraging him to work for an early diagnosis and to insist on prompt and suitable treatment.

Of the 2,541 patients with pulmonary tuberculosis who were discharged from the King Edward VII Sanatorium, Midhurst, between 1911 and 1921, the proportion of those alive between one and ten years later was, amongst those with a sound larynx, double that of those with tuberculous laryngitis. Of patients found to have tubercle in the larynx during these ten years, two out of every three were dead. Of those with a sound larynx, it is the reverse—two out of three were still alive. Of all the 477 cases of laryngeal tuberculosis which passed through my service at Midhurst between 1911 and 1921 no less than 70.5 per cent. are now dead.

This darkening of the prognosis occurs in all stages of the disease (see Fig. 3). Of patients with lesions in the lungs so limited that they were scheduled in Group I (of the Turban-Gerhardt classification) 82.6 were alive at a date when 50 per cent. of the patients with similar lung lesions, but with the addition of a deposit in the larynx, were dead. In Group II the mortality of laryngeal cases is more marked—two out of three cases are dead, while of those with a free larynx, two out of three were still alive. In Group III—that is, "advanced" cases—the difference is not so marked, for the mortality is so much higher with advanced pulmonary tuberculosis that the added danger of a laryngeal lesion is not so noticeable. Even in this group 42.3 per cent. of the patients were still alive amongst those with a free larynx, when only 22.7 per cent. survived, at the same date, of those in whom it was affected.

A glance at Fig. 3 will show that the mortality of laryngeal cases in Group I is higher than it is amongst the pulmonary cases with more extensive lesions of Group II but with a normal larynx (that is, a mortality of 50 per cent. compared with 39.08 per cent.). In Group II this mortality is 66.3 per cent., compared with a rate of 57.4 per cent. in the larynx-free patients of Group III.

Put in another way, a Group I patient (that is, a "slight" case) with a laryngeal lesion has a worse prospect than a Group II case with a sound larynx. And a Group II case (that is, a "severe" case) with throat trouble has a gloomier expectation than if he had had a healthy larynx but lungs so invaded as to be classed in Group III (that is, an "advanced" case).

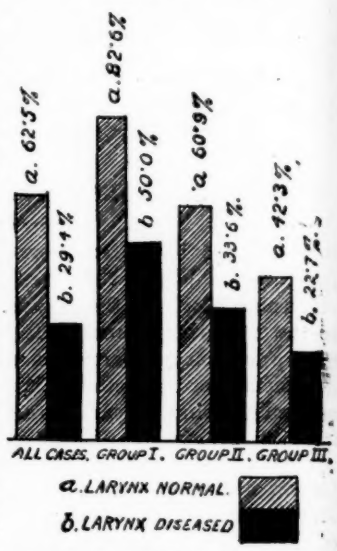

Fig. 3.—Percentage surviving in 1922 of patients (*a*) with larynx normal, (*b*) with larynx diseased from 1911 to 1921.

Differently expressed, the discovery of a laryngeal lesion at once moves a case down to a lower group. In fact, in our tabulation of cases in King Edward Sanatorium there are no laryngeal cases in Group I. We think so badly of this complication that, even if only associated with quite early lung trouble, disease in the larynx moves such a patient down to Group II. Therefore laryngeal tuberculosis cannot be listed in any group which might be termed "slight" or "favourable." Its discovery at once labels a case as "severe," and authorizes a physician to warn his client that treatment will necessarily, even in the most hopeful cases, be long and arduous. In only too many instances (in 70.5 per cent. of my fairly favourable selection) it will be his duty to advise the friends that the prospect of a recovery is so slight that it may be unjustifiable to submit the sufferer to any trying, dangerous, or expensive treatment.

Results of Treatment.

From these rather gloomy conclusions let us turn to my record of 119 cures. To appraise them at a fair value I may be permitted to say that such a large total of well authenticated cases of healing in a larynx with tuberculosis has never before been published in this country. The satisfaction of quoting this record is enhanced when I recall that in 1880 Morell Mackenzie wrote: "The prognosis of laryngeal phthisis is always extremely unfavourable and it is not certain that any cases ever recover"; and that as late as 1908 a well known German authority stated that: "The cure of tuberculosis of the larynx is still to-day an exception." Sixteen years after these words were spoken I am able to refer to 119 "exceptions"; many of them have been shown before sections of the Royal Society of Medicine; and some idea of the extent of lesion in which repair can be effected may be obtained by studying the illustrations shown on the screen. A complete repair of the larynx has been obtained in no less than 25 per cent. of patients with tuberculous laryngitis.

Cures: How Obtained.

I have no doubt that the principal factor in obtaining these arrests has been sanatorium regime and the prompt prescription of one or more of the three chief methods of local treatment—namely, whispers, silence, and the galvano-cautery. It certainly would be difficult to carry out the first two methods thoroughly except in a sanatorium. Their employment has always preceded the adoption of cautery application.

Fifty patients were cured—so far as local measures are concerned—by the simple reduction of voice use entailed by

whispers. This figure gave 14.8 per cent. as the proportion of cures in the 336 cases in which it was ordered. It may seem a small proportion, but it is low because all laryngeal patients are advised to limit voice use to whispers; many of them had no expectation of complete cure and were only put on "whispers" to avoid aggravation of the local trouble; others amongst them had, in addition, cautery treatment, and are therefore listed under that rubric.

Complete silence resulted in a cure in 23 instances, or in 34.3 per cent. of the cases in which it was ordered. The total of 23 cures out of 477 cases may seem small, but it was only carried out in 67 instances, for it was felt that such an ordeal should only be advised in promising cases. The number is also reduced by the subtraction of some who, in addition, had cautery treatment. The silence treatment was more successful with the women patients (41.6 per cent.) than with the men (25.8 per cent.). Women give a slightly higher percentage of cures, both with whispers and silence. Their greater patience and endurance—or recovery power?—being most noteworthy in the ordeal of the silence cure.

The *galvano-cautery* yielded 46 cures. This method gives the highest proportion of satisfactory results in the 74 cases in which I tried it (=46 per cent.), doubtless because the cases were carefully selected after being first watched, as a rule, for some months while under "whispers" or even silence. In one case the patient was fourteen months in the sanatorium before his larynx and general condition justified galvano-cautery treatment.[3] This patient was able to earn his livelihood and remained well and active for years. He then died of pulmonary haemorrhage: the larynx never relapsed. Another patient was a year under observation before the cautery could be used. She required fourteen treatments. It is seven years since the last; she is now free of bacilli and she earns her livelihood as a postmistress. These cases show that this method may be long and costly, fulfilling part of the saying that "the cure of tuberculosis requires a good stomach and a large purse!"

Results of Treatment by all Three Methods, of Silence, Whispers, and Galvano-cautery, in 477 Cases.

	Males.	Females.	Totals.	Per Cent.
Arrested	70	49	119	24.94
Improved	88	53	141	29.39
Statu quo	111	76	187	39.20
Worse	15	15	30	6.29
Total	284	193	477	

Durability of Cure.

After Silence.—Of 8 men cured by silence, 3 are alive at periods of one, two, and four years after discharge. The other 5 remained healed of their laryngeal lesions but have died from their pulmonary tubercle. Of 15 women, no less than 10 are alive and well after the lapse of two to ten years.

After Whispers.—Healing has been maintained in some cases for three, four, and even ten years. Fifteen out of 27 men, and 13 out of 23 women, are still alive and well.

After Galvano-cautery.—Of 46 cures, 28 are still alive, and in 6 of them the cured condition has persisted for ten years. As with the two preceding groups, the patients who are dead have succumbed to their pulmonary disease and, generally, without any laryngeal recurrence. Even of these I have been able to calculate that the average duration of life, after healing was complete, varied from two years and eight months in the men and to five years and two months in the women.

Benefit of a Healed Larynx.—During these years the patients were able to use their voices, and this voice use was not only a pleasure to them, but it removed the anxiety and depression which so many patients suffer from when tubercle attacks the larynx. The recovered voice also assisted them in their social duties and in gaining a livelihood.

Lasting Laryngeal Cures.—Thus of the 119 cases in which complete healing took place in the larynx, 69 are alive at periods varying from two to ten years afterwards. Fifty are dead, and they have died, as a rule, with a still cicatrized larynx. Their deaths, usually, were due to the extent or virulence of their pulmonary disease.

Proportionate Progress of Pulmonary and Laryngeal Lesions.

The above references to the durability of healing in the larynx, while the disease in the lungs progresses, are sufficient to show that tubercle does not necessarily progress *pari passu* in both situations. This latter view is still maintained, and, as it is not correct, it may occasionally mislead the physician.

Improvement very commonly does proceed along parallel lines, and, in the same way, a retrogression in one is often followed by progress of the disease in the other. For instance, a "flare-up" of temperature is generally followed by development of active signs in the chest and an increase of the disease in the larynx. But this is not constant. I have known of tubercle developing in the larynx just as the disease had become arrested in the lungs (and remaining so for twenty years) and the bacilli had disappeared from the sputum. On the other hand, I have frequently noted that the laryngeal disease had so far improved that the use of the cautery was indicated to complete the cicatrization, when I have received the report that the pulmonary disease was progressing. Indeed, as recorded in the preceding paragraphs, spontaneous cure has taken place in the larynx in many cases, and has been maintained till the patient died of his pulmonary disease years afterwards. But the reverse has never occurred—that is, I have never seen a larynx getting worse while the pulmonary disease has improved. It has occasionally, in such instances, been reported to me that the lung trouble was *statu quo*; but if the larynx did not mend the pulmonary disease inevitably, within a definite period, took on activity.

This is useful knowledge for the physician: a larynx may improve or get well, while the lung disease remains quiescent or gets worse; but if the disease in the larynx advances, the pulmonary disease cannot possibly become arrested, and soon makes progress. This again shows the value to the physician, from the point of prognosis, of periodic examination of the larynx.

The Pessimistic Past of Tuberculous Laryngitis with its more Optimistic Outlook.

The realization that of all my 477 cases, treated in a sanatorium during ten years, 70.5 per cent. are now dead is an arresting and a saddening thought. Nearly all of them were young people; few of them had induced their disease by vicious living; many of them had incurred it largely by excess of unselfishness or by a too ardent devotion to duty; and in no inconsiderable number it was directly due to their patriotic services in defending their country in the great war. This heavy toll demonstrates that tuberculosis in the larynx is always a serious complication of pulmonary disease. Physicians would be well advised to assure themselves of its presence or absence in any case of tuberculosis. If present, it adds considerably to the seriousness of the prognosis and to the prolongation of the care and time required for successful treatment, even in cases otherwise early and promising.

When the laryngeal lesion is extensive and active, the outlook is particularly serious. If the lesion is limited and becomes inactive, it may be arrested, although the prospect of life may not be great. From prolonged observations on nearly 500 sanatorium patients, a cure of the laryngeal lesion may be secured in one out of every four patients. These were, comparatively speaking, early cases. But a much higher proportion of cures could certainly be obtained

if more cases of pulmonary tuberculosis were diagnosed while they are still Group I patients (that is, with only 4.8 per cent. showing laryngeal lesions) instead of Group III (that is, with 31.5 per cent. with the larynx involved). More cures could be effected if every case of persistent huskiness or throat discomfort were earlier submitted to a skilled examination.

Principles of Success in Treatment.

It is manifest that a patient has a more sure hope of a quicker cure inside a well conducted sanatorium than he can expect otherwise. Even if he remains in a sanatorium only long enough to learn how to manage himself, this sojourn is highly beneficial. This is shown by the number of my cases which left Midhurst with the larynx still diseased but who kept up sanatorium principles and later on obtained complete and lasting cicatrization of their throat trouble.

The chief local requirement is voice rest, which can be so easily carried out in a sanatorium but is elsewhere so difficult. Out of 119 cases which were cured, the healing was obtained without other local treatment than voice rest (whispers or silence) in no fewer than 73 instances. That such a simple treatment—though long and arduous for the patient—can be so effective should encourage perseverance with it when indicated.

Local surgical methods of cure have all been abandoned by me as useless and frequently harmful. My statistics show that a laryngeal lesion generally indicates an extensive lung lesion, or a very virulent infection, or lowered resistance. As things are at present, the majority of patients with laryngeal tuberculosis soon die (70.5 per cent.); they generally die of their lung disease. Topical surgical measures in the larynx are only apt to hasten this; their successful local results have never been frequent or enduring; and we have, in the galvano-cautery, a safer and more certain help. The galvano-cautery has, in my practice, superseded all other topical measures—curetting, injections, insufflations, application of lactic acid or other caustics. I have never seen a single case in which it has done harm, although in some it has been abandoned as useless. It effected a cure in 46 out of 74 cases in which it was tried (=62.1 per cent.). Of these 46 cures, 29 are alive and well; 12 of them have now maintained their cure for ten years. The galvano-cautery is the best local treatment we have at present. In suitable cases it has replaced all other methods.

Conclusions.

The majority of cases of tuberculosis of the larynx do not recover. It is necessary for the physician to recognize this, to try and determine which cases come within this category, and to act accordingly. But these 119 cures are witnesses of the more hopeful outlook we now have for a fair proportion of patients of whom an authority has said that, forty-five years ago, "all were doomed to die; the appearance of the disease in the larynx was the warrant of death."[4]

The pessimistic past has now a more optimistic outlook. As the Minister of Health said lately on a public occasion: "The fight against tuberculosis was a long one, but it was a winning one."[5] At the recent Congress on Tuberculosis in Lausanne (August, 1924) it was shown by Sir Robert Philip that this fight is being won, not simply by the population becoming immunized or by such general advances as improved national health and hygiene, but by the measures of direct attack originated and inspired by our profession.[6]

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CERVICAL RIBS IN CHILDREN.

BY

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Ever since Sir William Thorburn[1] in 1905 showed that certain symptoms in the upper limb were associated with the presence of cervical ribs, an increasing number of reports upon this condition have appeared in medical literature. Supernumerary ribs have been recorded in both sexes and at all ages. Thorburn states that the earliest age he has met with them was the seventeenth year. Sir William Turner[2] refers to a case described by Rosenmüller in an embryo of six months, and Stiles[3] has also recorded a case in a female infant of 18 months. Nevertheless, comparatively little attention has been directed to the presence of cervical ribs as a possible cause of symptoms in children, and this paucity of data is all the more striking when one considers the increasing use of radiography at the present time. It is undoubtedly true that in the majority of cases the symptoms produced by cervical ribs do not appear until adult life is reached, and that in young children attention is perhaps only drawn to their presence by a prominence in the neck or by the accidental discovery of the condition in a radiograph of the neck.

The four cases of cervical ribs in children described in this paper have recently come under our observation and have led us to make further investigation into the frequency of their occurrence. The result has been to convince us that this condition has not received the consideration which it deserves.

The first of the four cases occurred in a girl 4 years of age, and although the ribs were causing no pressure symptoms, the child was brought to the Royal Manchester Children's Hospital early this year on account of two hard masses above the clavicle. The swellings were very prominent and extended from the spine to the first dorsal ribs. Radiological examination showed that bilateral cervical ribs were present. In the absence of any symptoms no treatment has been deemed necessary up to the present time.

In the second case, however, the pressure effects were so definite that operative treatment was clearly indicated. The case is worthy of detailed record, as it is unusual to find such typical symptoms at so early an age.

M. G., a girl aged 12 years, was brought to the Manchester Northern Hospital in June, 1923, complaining of neuralgic pain in the left forearm and hand, and a constant irritating cough. She was first seen by Dr. Mather, who was unable to find any clinical signs in the chest to account for the cough, but discovered a swelling in the left side of the neck. He referred the child to one of us for further investigation and treatment as being a case of suspected cervical rib. Examination revealed a hard bony tumour above the left clavicle, with some atrophy of the intrinsic muscles of the left hand. Pain was complained of along the ulnar border of the forearm and hand, but no circulatory or trophic disturbances were present. A radiogram demonstrated the presence of a large cervical rib on the left side arising from the seventh cervical vertebra. Operation for its removal was advised, and this we carried out shortly afterwards. A flap was made along the upper border of the clavicle and behind the sterno-mastoid muscle, the brachial plexus being then exposed. The plexus was seen crossing the cervical rib, the inner trunk lying directly on the bone. The rib was cleared in front and disarticulated through its juncture with the first dorsal rib, finally being divided behind with bone-cutting pliers as far back as possible. During its removal the pleura was damaged, but no trouble resulted from its injury.

Bleeding points were secured and the wound closed, firm pressure being applied with a pad and bandage. Recovery has been satisfactory, the wasting has now practically disappeared with massage, and there is no longer any pain.

The portion of the rib removed measured 1¾ inches in length. The anterior extremity ended in a joint with an articular cartilage and synovial membrane which joined it to the first rib. The attachments for the scalene muscles were clearly seen after its removal.

In the third case, also a girl aged 12 years, there was a pair of cervical ribs causing distinct swellings on either side of the neck; there were no pressure symptoms in this patient requiring treatment.

The fourth case was also found in a girl; here symptoms made their appearance at the age of 15. A right cervical rib was subsequently removed on account of the pain in the arm and the wasting of the small muscles in the hand, with fairly satisfactory results.

This succession of cases in the course of a few months suggested to us that it would be of interest to examine the records of the *x*-ray department of the Royal Manchester Children's Hospital. On doing so we discovered that in the last two thousand *x*-ray examinations, including all parts of the body, in no less than nine cases were cervical ribs reported to be present. The details of these cases are as follows:

No.	Sex.	Age.	Clinical Diagnosis or Symptoms.
1	F.	12 years 3 months	Cervical ribs.
2	F.	4 „ 5 „	Cervical caries.
3	F.	10 „ 11 „	Torticollis.
4	M.	9 „ 7 „	Cervical caries.
5	M.	2 „ 1 „	? Cervical caries—? trauma.
6	F.	12 „ 10 „	Cervical ribs, paresis of left arm.
7	M.	5 „	Torticollis—? cervical caries.
8	F.	4 „	Cervical ribs.
9	F.	7 „ 7 „	Torticollis—? cervical caries.

It is interesting to note that the disturbances due to the presence of cervical ribs gave rise to the clinical diagnosis of cervical caries in five cases, whilst in three instances their presence was associated with spasmodic torticollis. In many instances the differential diagnosis can only be made by means of radiography, and in most of these cases the presence of cervical ribs could not be definitely established on palpation, even after their demonstration by *x* rays.

The incidence of such a large number of cases in the course of fifteen months has convinced us that the occurrence of cervical ribs is more frequent in childhood than is generally supposed to be the case, and that we are well advised in drawing attention to the condition.

Most radiologists will, we think, agree that cervical ribs are less frequently detected in children than adults. Although the records of the Royal Manchester Children's Hospital show a comparatively large number of cases in a short period, we are inclined to think this is a somewhat unusual occurrence.

With regard to the relative frequency with which cervical ribs are found, there are no definite data available. Fischel of Prague[4] reports that in routine necropsy examinations over a period of four years the condition was found in 1 per cent. of all bodies examined. From the *x*-ray appearances observed in our group it appears that in the majority of cases cervical ribs are only partially ossified at birth and are not revealed by *x* rays until later in life. In one of our cases where well marked cervical ribs were palpable a radiograph showed that only a small portion of the rib was ossified. The dorsal ribs are ossified at birth, but at puberty secondary centres appear, and ossification and growth are not completed until about the twenty-fifth year. It is probable, therefore, that the ossification of a more or less rudimentary rib may be still further delayed, and this is suggested in our series of radiographs. We have seldom met with really large cervical ribs in children demonstrable by *x* rays, and this supports the view that their growth and ossification are not complete till later life, when the incidence of cervical ribs appears to be more frequently recognized. With the growth of the child the dorsal ribs increase in size and length, and cervical ribs will no doubt do likewise.

The fact that the onset of symptoms in these cases is usually delayed until after adolescence is accounted for by Todd[5] as being due to the descent of the shoulder-girdle, which is not complete till the third decade of life. An additional factor in causing dropping of the shoulder-girdle has been suggested by Stopford[6]—namely, weakness of the supporting muscles, producing stretching of the nerve trunks over the rib. We suggest, as a further explanation why symptoms are delayed till adult life is reached, the fact that ossification is not complete till after adolescence. It is natural to suppose that the increase in growth and size of the rib may lead to greater pressure on the nerve trunks, resulting in the nervous disturbances encountered in these cases. It is interesting to note in this respect that in our cases the pressure effects were most marked in those children possessing more completely ossified and therefore larger ribs. On the other hand, it is undoubtedly true that in adults severe symptoms are sometimes caused by comparatively small ribs, and that even a large pair of cervical ribs may produce no ill effects of any kind.

Cervical ribs are, for some unknown reason, found to be more frequent in women than men, and this is also borne out in our series, where ten out of thirteen cases occurred in the female sex. They are said to be bilateral in about 80 per cent. of cases, and in the group under review were bilateral in all except one case.

In many cases of cervical ribs no treatment will be found necessary. Where, however, symptoms are present a short course of non-operative treatment to promote development of the muscles supporting the shoulder-girdle should be tried. Should, however, no improvement result after two or three weeks, surgical treatment consisting in removal of the rib is indicated. When there is marked atrophy of the muscles of the hand their recovery is rarely complete, and this should be an additional reason for avoiding unnecessary delay. Where operation is undertaken before there is serious damage to the nerves it usually results in rapid subsidence of the disturbances.

Our thanks are due to Professor Stopford for valuable assistance and advice in the preparation of this paper.

Conclusions.

1. Cervical ribs are congenital abnormalities and may be found in children at all ages.

2. In thirteen recorded cases twelve were bilateral and ten occurred in girls.

3. Their diagnosis will frequently only be made after radiographic examination.

4. In the majority of cases symptoms do not appear till adult life is reached.

5. The delay in the onset of symptoms may be due to the ossification of the rib, which is not complete till about the twenty-fifth year.

6. In young children, however, they occasionally give rise to very definite symptoms in the upper limb similar to those seen in adults.

7. In others their presence may lead to a diagnosis of spinal caries or torticollis, and the differential diagnosis can be established only by radiography.

8. Only rarely will treatment by operation be considered necessary.

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VENOUS PULSATIONS AND VENOUS TRACINGS.

(A Supplementary Note.)

BY

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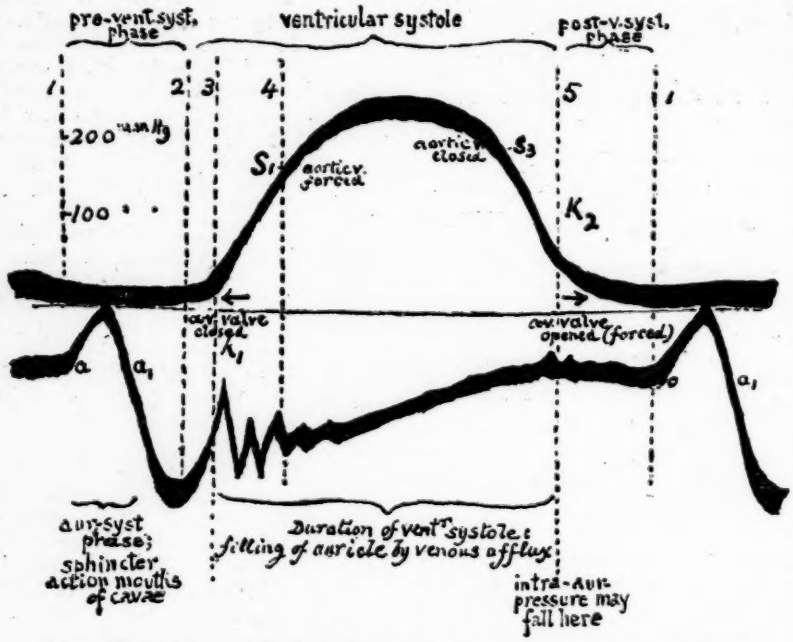
In the British Medical Journal of April 14th, 1923 (p. 626), certain criticisms on the current interpretation of the polygraphic tracings, obtained from the root of the neck, were brought forward, and, in view of the discrepancies which seemed to show between the interpretation and the actual sequence of events in the cardiac cycle, I ventured to suggest that the whole subject should be referred to the physiologists. Upon further consideration of the matter, and after careful study of the endocardiac pressure tracings taken with Piper's manometer, or its equivalent, I have come to think that perhaps physiology has already spoken to some purpose; and it is this pronouncement which I desire now to bring forward in an endeavour to complete and confirm the argument previously presented.

In Piper's manometer the elimination of the instrumental error, by the utilization of the beam of light in lieu of the mechanical lever, seems to have brought the recording apparatus almost as near perfection as possible. There still remains the inertia of the vibrating membrane carrying the mirror which reflects the beam, but this source of error has also been reduced to a minimum. It is this instrument which has disproved the presence of negative pressures in the chambers of the heart during the act of diastole.



Endocardiac tracings taken with Piper's manometer (from the dog). The tracings are taken simultaneously from the left ventricle (above the base line) and the left auricle (below). The curves are to be read from left to right. A complete cardiac cycle is shown—namely, from the onset of one auricular systole to the onset of the next. The base line (with opened thorax) represents the zero of atmospheric pressure. Ordinate 1 marks the onset of the auricular systole; Ord. 2, the onset of ventricular systole; Ord. 3, K1, the point of closure of the auriculo-ventricular valve; Ord. 4, at S1, the forcing of the aortic valve; Ord. 5, K2, the opening (forcing) of the auriculo-ventricular valve. The point of closure of the aortic valve has been placed arbitrarily at the point S3 to indicate that it will stand higher on the curve than S1, because the intra-aortic pressure will be at its highest towards the end of ventricular systole, at which time the aorta will be most distended. On the auricular curve *a* marks the onset, *a*1 the ending of the auricular systole.

The figure is reproduced from Starling's *Human Physiology* (third edition, 1920) by kind permission of the author and the publishers (Messrs. J. and A. Churchill); some letterings and numberings have been added to the figure, also some descriptive words, but no alteration of any kind has been made in the tracing itself.*

Let us now endeavour, along these curves, to follow the sequence of events within the auricle during the cardiac cycle. We start with the auricular systole.

At whatever level of pressure the intra-auricular pressure may have stood at the moment immediately preceding auricular systole, this event now superimposes its own reinforcement. The pressure line starts at *a*, rises more or less abruptly, culminates, and then falls, until it reaches the point a_1, the fall of the line reproducing approximately the line of ascent. At the point a_1 the auricular systole is wholly spent; at the same moment the ventricular filling is completed. At this point Hürthle has detected a slight intraventricular rise of pressure which will stand for the auricular systolic effort now transformed into tension of the ventricle.* Upon withdrawal of the auricular systolic effort this intraventricular pressure, however slight its rise, will be positive as compared with the intra-auricular diastolic pressure then ruling, and it must take effect backwards (since there is no outlet forwards). But in opposition to the ventricular recoil stands the auriculo-ventricular valve, the cusps of which, therefore, will first be floated into position and then carried back under slight tension. This effect will follow immediately upon the completion of the auricular diastole. If now we turn to the tracing we note that at the point a_1 the falling intra-auricular pressure line continues its descent without any break or perturbation until it reaches its minimum. What is the conclusion? That this primary ventricular recoil is too weak an effect to register itself within the auricle "let alone to record itself in the internal jugular vein."†

Auricular diastole is thus silent, but what of its antecedent auricular systole? The tracing presents a very definite wave-like rise and fall. Is this an undulation? No; it is just a pressure or tension curve, no more, corresponding in this respect exactly to the curve of the ventricular systole above the base line, but it may beget an undulation if there be any point of outlet from the auricular chamber. There are two outlets—one forwards into the ventricle, one backwards into the veins feeding the auricle. Without doubt there will be a fully developed *forward* effect as the blood is propelled into the ventricle, but this can have nothing to say to us who are watching events at the root of the neck,‡ for the internal jugular vein can only register backward developments arising within the auricle. Now, as to these latter, let us consider first the purpose of the auricular systole and ask, Why are the auricular walls reinforced with muscular fibres? The answer is, In order that the auricles may become contractile chambers, and so may reinforce the spent powers of the circulation, fallen to a minimum in the great veins; thus they will ensure a better filling of the ventricles and

* It must be borne in mind that the tracings above and below the line, as shown, bear no relation to each other in respect of their *force values*, for whilst the intraventricular values are measured in millimetres of mercury and in hundreds, the intra-auricular values are measured in millimetres of water and in tens; so that in actuality the auricular curve, whilst keeping the time relations here shown, would, if brought into scale with the ventricular curve, run close to the base line, 1–3 mm. of mercury, above and below the base line, including approximately its upper and lower limits. Another point should perhaps find mention—namely, that the figure as it stands represents the functioning of the heart with the thorax opened, therefore with the base line at the level of the *atmospheric* pressure, whereas the normal working of the heart is with closed thorax, and the base line consequently at the mean level of *negative* pressure which rules under these conditions. Accordingly, to bring the two curves into their proper relation of normal functioning it would be necessary to bring down the base line to the proper level of the mean negative pressure obtaining in health within the thorax, thus causing the two curves to overlap more or less. However, neither of these qualifications interferes with the time relations of the two curves. See also Professor Carl Wiggers, *Circulation in Health and Disease* (second edition, 1923, Fig. 28, p. 97), in illustration of these points. This figure brings out admirably the contrasting force values of the intraventricular and intra-auricular pressures.

* Starling, p. 943.

† See British Medical Journal, Venous Pulsations and Tracings, April 14th, 1923.

‡ We are now considering the tracing as a right heart record, and are justified in so doing, since the right heart enactments repeat exactly in form and sequence those of the left heart; in force values only will they differ.

will facilitate the general onward movement of the venous blood. Let us next look at the disposition of the fibres, and in particular take note of their arrangement at the mouths of the tributary veins.* It will be seen that they encircle these inlets and in the act of contraction must, sphincter-like, close them more or less. Here comes the crux of the matter: how complete is their action? As to this, I understand from Professor Starling that precise physiological determination is lacking; but in its absence it is probable that certain conclusions may be drawn and will find general acceptance; these are:

That in health we may expect the sphincter action at the mouths of the two cavae and of the pulmonary veins to be a very appreciable quantity during auricular systole, seeing that both structure and purpose point in this direction; for how is the auricle to get up a sufficient head of pressure to complete the ventricular filling if there is an abundant reflux leakage into the great veins at each systole? At any rate it must be clear that by *as much as there is backward reflux at each systole the auricle will fail in its propulsive effort*. And again, the object of the auricular systole being to facilitate the general onward movement of the venous blood, how would that purpose be served by an abundant reflux, which must oppose that movement? The argument gains in authority when we regard the great capacity of the tributary veins, especially of the cavae; their thin, therefore distensible, walls; and further, when we remember that in health these veins are underfilled; all the circumstances thus conspiring to favour reflux in the absence of a pronounced sphincter action.

The force of these deductions will not be weakened because in disease, marked by engorgement of the right heart and of its tributary veins, we are obliged to admit that sphincter action is almost certainly in default, more or less; and that in paralysis of the auricle (fibrillation) it must be in complete abeyance; rather will the argument be strengthened because we then see before us the circulatory failure which attends upon or is accentuated by a failure of sphincter action. Pending the physiological determination of this matter we may sum up as follows:

(*a*) Supposing that in health sphincter action at the mouths of the cavae is complete, there will be no possibility of an *a* wave in the internal jugular vein as a backward propagation effect due to auricular systole.

(*b*) Supposing, on the other hand, an incompleteness of sphincter action, whether in health or disease, this, *pro tanto*, will favour the propagation of an auricular systolic wave into the superior cava, which may or may not reach the internal jugular vein in measurable strength.

(*c*) But that, in respect of the last-named conclusion, we must not forget that even in health the force value of the auricular contraction is very small; whilst in disease, with right-sided congestion of the heart, it will be more or less impaired even to complete extinction.†

(*d*) Finally, it must be repeated, Piper's tracing of the auricular systole tells us only of a rise and fall of pressure *within the auricle*; of events within the tributary veins, associated or not, it says nothing, directly: that is a matter of inference and as such is debatable.

Are there any possibilities of an *a* wave caused by the auricular systole yet not due to propagation backwards from the cavity of the auricle? Physicists have contended that there are; they point to the effect of suddenly interrupting the flow of a stream of liquid as by the turning of a tap. The rebound which then takes place at the site of the interruption is a familiar manifestation. Dr. Samways‡ in particular has argued for this mode of origin of an *a* wave propagated back from the *closed* mouths of the tributary veins, and Professor Starling also admits the possibility of this mode of action. Whether a phenomenon which holds for a stream of water flowing under considerable pressure (as compared with the venous pressures of health and disease) through a system of rigid tubes would find its counterpart in the low-pressured afflux of the great cardiac veins, the walls of which are thin and elastic and, in general, incompletely filled, this I must leave to the physiologists and physicists to decide; but if it should be established it would surely demand *complete occlusion* of the mouths of the auricular veins during the early auricular systole?

The next intra-auricular event comes with the forcible recoil of the auriculo-ventricular valve, which is effected by the onset of ventricular systole. We have already referred to a slight recoil of this valve, bringing the cusps into position, which will take place at the end of auricular systole, when the force which completes the filling of the ventricle is withdrawn. The cusps thus in position will present the valve as a cone with its apex towards the ventricle, but now, with the rapid and forcible contraction of the ventricle, the valve will be driven back towards the auricle along with the contents of the cone, and an impulse imparted to such residual blood as may have been left over in the auricle at the end of auricular systole, augmented further by influx from the cavae, which upon cessation of auricular systole will at once unload their excess of blood, accumulated during its persistence. This strong movement of the valve begins quite early in ventricular systole, as shown at K_1. What is its effect within the auricle?

We see in immediate sequence certain sharp-peaked oscillations of the pressure line, at times still more pronounced than here shown, according to Professor Starling. These oscillations have the characters of true undulations, of the ridge-and-trough type, and we note their gradual subsidence whilst keeping to type. Evidently the contents of the relaxed auricle have been set in motion by the impulse they have received. The dying away of the perturbation is a familiar inertia effect which may apply to the contents of the auricle only or be due to the swinging of the valve, the result of a jerking action of its attached muscles, which would communicate itself to the contents. Be this as it may, here is the *onset* of ventricular systole announcing itself unmistakably. But the contents of the auricle are in free fluid communication with the blood in the tributary veins, since in the relaxed auricle there is no obstructing sphincter action; therefore to the development of an early or earliest ventricular systolic wave in the internal jugular vein there is no impediment. It is for this that I have contended—namely, that admitting for argument's sake the presence of a pre-ventricular systolic *a* wave, the next event in the cardiac cycle must be styled a *v* wave, since it marks the onset of ventricular systole.

From this point onwards, proceeding with the cardiac happenings, the contents of the auricle are shut off from all communication with the ventricle (assuming that the auriculo-ventricular valve holds), so that nothing occurring within the ventricle can propagate itself backwards into the auricle until the auriculo-ventricular valve opens again, and till this happens the auricular contents are solely under the influence of the venous afflux via the cavae.

It will be convenient here to leave the intra-auricular developments for a while in order to discuss a wave, marked *c* on the polygraphic tracing. This wave is placed directly after the *a* wave, and, so situated, it does not merely take precedence of the wave caused by the onset of ventricular systole, which we have just been considering, and which figures so prominently on Piper's tracing, but completely ousts it, inasmuch as the latter appears nowhere on the polygraphic record. The *c* wave is held to originate in the impulse which the carotid beat transmits to the adjacent internal jugular vein; and that all adjacent structures must feel this impulse is indisputable. The contents of the vein, therefore, will be set in motion, but the question is, At what point of time does this incidence take place? The arterial pulse originates on the left side of the heart at the aortic valve at the moment when

* See Henle's *Handb. d. Gefässlehre d. Menschen* (second edition, 1876, Figs. 35 and 36, pp. 48 and 49). These figures have the more authority in that I do not discover them to have any *ad hoc* application by Henle.

† The question of hypertrophy of the right auricle is so rare an occurrence as to be negligible clinically, and left auricle activities, of course, do not record themselves in the internal jugular.

‡ BRITISH MEDICAL JOURNAL, April 13th, 1912. I regret that I had overlooked Dr. Samways's views as to the sphincter action at the mouths of the auricular veins when I wrote my paper (BRITISH MEDICAL JOURNAL, April 14th, 1923).

the rising intraventricular pressure forces the valve. This moment is marked S_1 on Piper's tracing. If now we look at the figure we see that a very appreciable interval* lies between the closure of the auriculo-ventricular valve, which takes place almost immediately after ventricular systole has begun, sometimes "synchronously with it,"† and the opening of the aortic valve. The actual length of the interval can be found by measuring the distance of the point S_1 from the ordinates 3 and 2 respectively, and if we do this with compasses we find that it varies from one-fifth to somewhat over one-fourth of the total duration of the ventricular systole, counting from the closure of the auriculo-ventricular valve until the opening again.

From Piper's tracing, then, it is quite clear that an early ventricular systolic undulation arises within the auricle, at or immediately after the closure of the auriculo-ventricular valve, and that it precedes the arising of the arterial pulse at the aortic valve by a well marked interval. How are we to reconcile the conflict here seen between the heart happenings and the polygraphic record?‡ As it stands there are two cardiac events which are capable theoretically of wave production within the internal jugular vein—yet the polygraph shows us only one wave, and that wave is attributed to the second event, to the complete exclusion of event No. 1. Why? Let us suppose that each cardiac event starts a wave, and that each wave makes for the same point in the internal jugular vein—what will happen? (1) There will be two waves, if these arrive at different points of time; (2) if they happen to arrive simultaneously, there will be one large wave, provided that the two waves are in like phase, for then they will reinforce each other; (3) there will be one diminished wave if they are in opposite phase, for then they will clash and cancel each other more or less; (4) there remains as a final possibility that, still being simultaneous, the two waves will cancel each other wholly, they being not only in opposite phase but of equal force value, according to the well known physical law of interference.

Let us now return to the intra-auricular happenings which, upon the subsidence of the perturbation caused by the abrupt closure of the auriculo-ventricular valve, were left under the sole influence of the venous afflux gathering behind the shut valve. As I have previously stated, this afflux itself bears no pulsation. Under these conditions what should we expect? What else but a gradually mounting pressure line as the blood accumulates in the auricle. This rise of pressure would of necessity communicate itself backwards to the tributary veins, the cavae and their branchings, including, of course, the internal jugular; indeed, the cavae and their branchings, together with the auricle, will form but one continuous cavity, since the auricle is in diastole, and therefore no sphincter action is in operation. The auricular congestion would therefore involve a venous congestion, and in the veins the pressure rise would follow the same course, mounting steadily by a summation of small quantities. And what do we see in Piper's tracing? This selfsame gradual and smooth rise throughout the continuance of ventricular systole, which rise presents nothing of the nature of a wave, being just a tension curve. At the end of the systole, upon the opening of the auriculo-ventricular valve, we do see, however, a slight perturbation, and the ascending pressure line gives place to an almost horizontal plateau. What has happened? The word "opening" as applied to the valve makes a wrong impression; it suggests the active opening of a door. This is not the case: we may liken the valve action to that of a swing door opening freely in one direction but unable to move in the opposite direction beyond the point of closure. The rising intraventricular pressure held the door closed during the whole of the systole, but upon its cessation—that is, upon the withdrawal of the muscular contraction—there was simultaneously a withdrawal of the holding force, and the door was left, a passive structure, free to move under the force of the accumulated intra-auricular congestion. This force is, comparatively, very small; it is represented by the stretch of the auricle and the stretch of the thin-walled veins which feed it, but in the end these distensions do suffice to push open the valve (which opposes only its own inertia, a negligible quantity), and then they proceed to separate the relaxed ventricular walls, filling the ventricle as far as they are able. In this act of ventricular filling the relaxed *v* walls play a wholly passive part (for there is no negative pressure generated, therefore no suction exerted), but the walls of the ventricle being much thicker than those of the auricle and, *a fortiori*, than those of the veins, these do oppose an appreciable inertia to the unloading of the auricle and its veins. Accordingly we shall not be surprised to discover that, considering the smallness of the forces engaged, the unloading takes place quietly and with but slight falling off of the intra-auricular pressure line. Consulting the figure, this corresponds precisely with what we have been led to expect from the physics of the problem. I gather from Professor Starling that Piper's tracing is a typical one—that is, it represents an average result—and consequently the typical pressure curve within the veins communicating with the auricle will repeat exactly the form of the curve of the intra-auricular pressure as shown in the tracing. The average case, therefore, will present no wave of venous "stasis" (accumulation) either in auricle or vein during the course of the ventricular systole subsequent to the disturbance on the closure of the auriculo-ventricular valve.

But whilst we may regard this course of things as the rule, the exception may show us a more or less pronounced divergence. In fact, Straub's intra-auricular tracing (taken from the cat)* does show us such a variant with a marked fall of pressure at the end of the ventricular systole. How is this to be explained? Perhaps as follows: Supposing the walls of the right ventricle to be less developed muscularly than usual, and therefore to approach more nearly to the auricular wall in thickness; supposing for some reason or other the tone of the muscular fibres be lowered—then upon cessation of ventricular systole the forces opposing ventricular dilatation will be greatly diminished and the congested auricle will be able to unload itself with comparative ease, causing therewith a more or less marked fall of pressure. Straub's result would then be reproduced.†

Be the explanation what it may, the fact of the variability remains; but the point to observe is that in those cases where the fall in pressure is "very distinct" at the end of ventricular systole, the rise and fall of the auricular pressure line may simulate a wave. However, that we are then dealing with a simulacrum and not with a true undulation appears unmistakably in this, that the up-stroke of the tracing is not repeated in the down-stroke, the pseudo-wave presenting a *gradual* ascent but a *sudden* descent.‡ Accordingly this asymmetrical tracing which the auricle yields, and which the contents of the internal jugular must repeat exactly; will always contradict the *v* wave of the polygraphic tracing, which in its sharp rise and fall, as figured, reproduces exactly the characters of the waves *a* and *c*, and therefore does not correspond in any sense to the theory of its production—namely, *by slow accumulation and sudden release*. In point of fact the intra-auricular tracing which obtains after closure of the auriculo-ventricular valve and persists till it reopens is just a pressure curve and nothing else.

Briefly, then, it comes to this, that when we compare the polygraphic record of the pulsations at the root of the neck, *as interpreted at present*, with the sequence of activities which the cardiac cycle exhibits, according to the experimental findings of physiology, we discover a want of agreement which forbids the utilization of that record for clinical purposes so long as the disagreement lasts.

* Sir James Mackenzie describes this interval as "a minute portion of time" (*Diseases of the Heart*, third edition, p. 262).

† Cf. Starling, op. cit., loc. cit.

‡ How this interval will be modified by reckoning out the propagation times of the auricular undulation and of the arterial pulse from their respective starting points to the root of the neck remains to be seen.

* Starling's *Physiology*, p. 946.

† Wiggers, op. cit., p. 89, draws special attention to this variable behaviour of the intra-auricular pressure at the moment when the auriculo-ventricular valve ceases to be held; he says: "At this point the venous pressure falls more or less; *sometimes it is a very distinct drop, at other times barely perceptible.*" (My italics.)

‡ British Medical Journal, April 14th, 1923, loc cit., Fig. 3.

A CLASSIFICATION OF CHOREA IN RELATION TO ITS CAUSES.*

BY

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OVER a period of many years a large number of cases of chorea have passed through my hands at the Royal Liverpool Hospital for Children at Heswall, and an opportunity has thus been afforded for investigating the causes of the disorder. Although chorea is classed as a disease and is described as such in the textbooks, it really is a condition of a neuro-muscular inco-ordination which may result from very different causes. It is a symptom rather than a disease, and I have come to classify it with reference to its origin, and not to mass all the cases under a single generic title. Thus we have:

1. The ordinary: rheumatic or toxic type.
2. "Stock-brained" cases: related to an inherited tendency.
3. A climacteric type.

There is often little to distinguish these cases so far as the movements of inco-ordination are concerned, but some of the associated phenomena present considerable distinctions.

One of the first lines of inquiry consisted in a primary classification of all the cases into those which were rheumatic or developed endocarditis or pericarditis and those which did not, and it appeared that the latter were often ascribed to fright or mental upset or some peripheral source of irritation, so that we had (1) rheumatic choreas, and (2) fright, etc., choreas.

Next came a careful scrutiny of the histories of both types, and the interesting fact was revealed that in the second class the children were sometimes left-handed themselves or, being right-handed, came of a left-handed stock, whereas the rheumatic children presented this kind of history in a very limited number of cases—probably representing rheumatism in children having the hereditary factor referred to. It was on this account that the non-rheumatic cases became styled "stock-brained choreas," and it is with these that I shall mainly deal here.

In a few instances children suffering from this form of chorea have belonged to families in which there were stammerers—a fact which throws some light on the nature of the condition. The choreic movements probably represent a gross motor ataxia or inco-ordination which may be regarded as analogous to vocal stammering. An example of this was seen in a boy (Robert S.), aged 6, who had well marked chorea, ascribed to the excitement of going to school for the first time. He was left-handed. The only other child, a boy, was right-handed and a stammerer. The father was a left-handed stammerer and so was his brother. Another similar case was seen in a girl who had chorea accompanied by acute vocal stammering which resulted from terror. She was left-handed and had a stock-brained history. I mention these cases simply to indicate the suggestive relationship which probably exists between this type of chorea and stammering, which has long been known to be in some way associated with familial left-handedness.

I have a large collection of cases of chorea presenting this stock-brained history, many of them acute, and so far as general symptoms are concerned in no way different from the rheumatic ones. The history is in some cases direct, in others collateral. It will suffice if I quote some examples of each to illustrate my point.

1. Margaret K., aged 9. Severe and prolonged chorea. Left-handed. Both parents right-handed. Four maternal uncles left-handed. This child had rheumatism two years before the attack.

2. John D., aged 13. Mild chorea; no history of rheumatism; attack followed a small operation. Left-handed. Has a right-handed sister. Father's family all right-handed. Mother, mother's paternal grandmother, father, and sister left-handed.

3. Robert S., aged 6. Severe chorea the result of fright; no rheumatism, no cardiac symptoms. Left-handed. Father left-handed and a stammerer, one brother right-handed and a stammerer. Father's brother stammered. Mother, seven sisters, and a second brother right-handed and normal.

4. Henrietta H., aged 8. Severe chorea the result of being knocked down by motor. Right-handed. Father right-handed, mother left-handed. No history of rheumatism, no cardiac symptoms.

5. Edward J., aged 7. Severe chorea; no rheumatism or cardiac symptoms. Left-handed; stammered occasionally for three months before this attack. Mother's father left-handed.

6. Thomas E., aged 11. Severe chorea the result of accident. No rheumatism or cardiac symptoms. Right-handed. Father and mother right-handed. Mother has two left-handed brothers. Second attack of chorea followed dog bite.

7. Elsie C., aged 6. Severe chorea the result of dog bite. No rheumatism or cardiac symptoms. Right-handed. Father and brother left-handed.

8. Eileen A., aged 8. Severe chorea the result of fright (father threw paraffin on fire). Left-handed. Father left-handed, mother right-handed.

9. Hilda O., aged 8. Severe chorea—frightened by a dog. Right-handed. Parents right-handed. Has left-handed brother and aunt.

10. Muriel D., aged 6. Severe chorea—knocked down by bicycle. No rheumatism or cardiac symptoms. Right-handed. Mother's mother and brother left-handed.

11. Ada D., aged 12 (sister of above). Severe chorea—ascribed to sister's illness.

In all probability these choreas do not occur in children who come of a pure right-handed strain, nor would they in a purely left-handed one if such existed. Right-sidedness and left-sidedness are both hereditary, but the vastly larger proportion of right-handed people renders it impossible that there should be a pure left-handed strain in any family—that is, one uninfluenced by a right-handed dominance.

From the histories which I have collected I gather that it is where there is a partial or repressed transposition of cerebral function that we find the explanation of these cases—that is, they occur in children who are right-handed, but where there is a stock-brained left-handed influence at work, and in left-handed children where a repressed right-handed inheritance produces its influences. As a consequence of fright or other disturbance an unbalancing of co-ordination is brought about, owing to some unusual relationship of function on the opposite sides of the brain.

To revert to the stammerer, we have this kind of involvement of the speech apparatus. Stammering in a right-handed person may result from a determination towards left-handedness with a dominant left cerebral speech centre, whereas in the left-handed person it may result from there being a determination towards right-handedness with a dominant right cerebral speech centre. Hughlings Jackson, in his writings on the speech centre, regarded the centre in the left brain as being the leading centre, its fellow in the right brain as an automatic one.

It was on this basis that he accounted for the repetition of words and recurring utterances of sentences in a "barrel organ" way in some cases of right aphasic hemiplegia. He gave examples showing that these utterances often expressed the last call of the individual when struck down by the apoplexy. I recollect a case of the kind where the patient from the time of his seizure until his death repeated the words "I want some brandy"—no doubt the result of his feeling sick and faint when the haemorrhage occurred. Hughlings Jackson explained that these expressions probably come from the undamaged right automatic centre after being initiated in the left one immediately before it was put out of action. Thus there is a double cerebral service. If this be the case, it no doubt throws light on the relative functions of the two centres in a normal individual. One can well imagine that where a stock-brained influence impresses a tendency for automatism in a leading centre or for a centre having automatic functions to take on leading ones the inco-ordinations expressed as choreas might easily be brought about; the slender balance being upset under the influence of fright or other emotional or peripheral disturbances. Whatever the explanation, the fact remains that there *is* this type of chorea which occurs in children presenting a stock-brained history.

Before parting from this type I may mention three examples of congenital aphasia which have come to my notice. Two of them (girls) were left-handed, and all presented a collateral sinistral history. Of the two girls, one was mentally defective, the other, aged 6, was absolutely bright and quite up to the standard of intelligence

* Presented at the Association of Physicians of Great Britain and Ireland in 1923, and read at the Liverpool meeting of the Children's Section of the Royal Society of Medicine at Liverpool, June, 1924, with illustrative cases.

for her age. Although she could not speak, like the lesional aphasics, she could hum tunes and tried to sing with words. The third case was a boy (G. B.) aged 2 years and 10 months, who has never spoken. He makes efforts to speak like a child stammering very badly. He is a well proportioned child for his age, but his mental condition is difficult to estimate. His mother considers him quite intelligent. He is right-handed, but comes of a left-handed stock—that is to say, his mother is right-handed but her brother and sister and her mother also are left-handed. In these cases suggestion of lack of cerebral correlation again arises. I had one case of a left-handed boy who only began to stammer when an attempt was made to make him a right-handed writer.

A further outcome of this inquiry into the histories of the non-rheumatic choreas has indicated another causal factor which must not be overlooked. The condition occurs in both sexes, but the majority of the cases recorded were girls at or about the period of puberty presenting, as so frequently happens, certain constitutional disturbances manifested by the complexion becoming bluish or heliotrope, the hands and feet cold and blue, the heart large and palpitating, the liver somewhat small, and the thyroid enlarging. Here we have an unestablished balance of the internal secretions and a tendency to nervous upset. Chorea is not uncommonly related to this condition, and the cases constitute a class by themselves—the climacteric choreas. As in the stock-brained cases, the disorder is often precipitated by emotional causes. In the one it results from a chemical or metabolic inco-ordination, in the other from an anatomical one.

I am indebted to Dr. Simonne Thompson and to my resident physician, Miss Norah Walker, M.B., Ch.B., for having taken much trouble in tracing the stock-brained histories of every case of chorea, whether rheumatic or otherwise. Since leaving the Royal Liverpool Children's Hospital at Heswall, Miss Walker has carried out an independent investigation and has collected a considerable number of cases which confirm the above findings.

ACUTE APPENDICITIS IN A CHILD COMMENCING WITH DIARRHOEA AND CONVULSIONS.

BY

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The case here recorded presents many points of interest. In the first place it had to be determined whether the child was suffering from meningitis with abdominal symptoms or from abdominal symptoms with meningismus, or possibly from two separate diseases. The one thing that seemed essential was to open the abdomen quickly and deal with the appendix. Presumably the very severe diarrhoea was an attempt on the part of the body to get rid of some of the toxin. The convulsive attacks also were apparently due to the same cause, for the operation seemed to produce an almost magical effect upon the appearance and condition of the child. Personally I have never seen an attack of appendicitis commencing with severe diarrhoea and convulsions, and I think that the case may be of interest to other clinicians; doubtless some surgeons have seen similar cases.

Maud A., aged 6, was admitted into one of my cots in the Royal Waterloo Hospital for operation on enlarged tonsils and adenoids. Four days after admission the child had a sudden very severe and continuous diarrhoea for fifteen minutes. The ward sister, who was with the child all the time, stated that she had never known a more severe one. For several days afterwards constipation followed. Shortly after the diarrhoea ceased general convulsions occurred; the whole body seemed to be affected, but especially the limbs and tongue. These attacks continued for four hours before they could be checked. There were twitchings of the lips, tongue, eyes, and limbs. The child at first appeared to be weaker on the right side of the body, but later the left side was noted to be weaker than the right. The pupils became dilated; the colour was first pallid, but later on the child became cyanotic. There was stated to be foaming at the mouth.

The urine examined during the attacks showed nothing abnormal. The child was given potassium bromide 10 grains and chloral hydrate 2½ grains by the rectum soon after the convulsions began, but this had no result. Later 30 grains of the bromide and 5 grains of the chloral were injected, but ultimately chloroform had to be administered to check the attacks. During the same night the attacks lessened and the child finally fell asleep, but later on was awakened by three or four attacks of vomiting. The vomit being of a greenish fluid nature.

The next day, when the child was examined, the tongue was very furred. The lips showed a small trauma from the application of the forceps to the tongue on the previous night. The child seemed to be in a semi-comatose condition. Vomiting continued. The bowels had not acted since the initial short attack of diarrhoea. Urine showed the presence of acetone, which possibly was due to the administration of chloroform during the attacks.

The child complained of pain in the upper part of the abdomen, and there was tenderness in that region. No tenderness was elicited by Mr. Cockell, my house-physician, at this period in either iliac fossa, but when he examined the child later in the day there seemed to be some tenderness in the right iliac fossa, which appeared to be a little more noticeable over McBurney's point than anywhere else in this area, compared with the left side. I saw the case a few hours later on the same day, and the child still appeared to be semi-comatose. The pupils were markedly dilated, the left perhaps more so than the right. Ophthalmoscopic examination was not made. Photophobia was present. No stiffness of the neck was elicited, nor discharge from the ears, nose, or throat. The tongue was dry and furred. The tonsils were distinctly enlarged, and very slightly red on the surface. There was slight stiffness of the left arm and left leg compared with the right side, and the left knee-jerk was also a little brisker than the right. On the left side there was slight ankle-clonus. Babinski's sign was not obtained. Kernig's sign was just present on the left side on this occasion only. The abdomen was retracted; tenderness was evident in the right iliac fossa in the region of McBurney's point. Resistance was noted. The note over the right iliac fossa was slightly impaired upon light percussion; there was no discharge from the vagina. Examination by the rectum disclosed nothing definite. The heart and lungs appeared to be normal.

The diagnosis of appendicitis was made, and Mr. Cairns Forsyth came down to the hospital and operated immediately. The appendix was found to be very long, distinctly distended, and acutely inflamed. It was filled with hardened faeces. A large number of shotty glands were seen in the mesentery. The child made an uninterrupted recovery. No further diarrhoea occurred, and the mental state cleared up wonderfully immediately the child came round after the operation. There were no more convulsions, and all the limbs appeared to be quite normal next day.

British Medical Association.

PROCEEDINGS OF SECTIONS AT THE ANNUAL MEETING, BRADFORD, 1924.

SECTION OF SURGERY.

Sir Cuthbert Wallace, K.C.M.G., C.B., F.R.C.S., President.

DISCUSSION ON POST-OPERATIVE PULMONARY EMBOLISM.

OPENING PAPER

BY

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Pulmonary embolism may occur as the result of many different morbid conditions, but the most important, and that to which I shall chiefly confine my remarks, is as the after-result of an operation. Pulmonary embolism is by no means always fatal, and although no really reliable statistics on this point are available I should estimate that not more than one out of every ten cases of pulmonary embolism causes the death of the patient; in the remainder the patient recovers. There seems little doubt that most of the cases of so-called post-operative pneumonia are in reality cases of pulmonary embolism.

Pulmonary embolism may occur at any period after operation up to several weeks. The most common time is about the eighth or ninth day, but it has occurred within twenty-four hours of an operation, and in one case eight weeks later. Statistics are difficult to obtain, as the cases are comparatively infrequent and careful tables are not kept at most hospitals which will allow of the figures being

got out. The following table gives some idea of the incidence of the condition, but shows only fatal cases.

Chelsea Hospital	9	cases out of	5,406	operations
St. Mark's Hospital ...	6	,, ,,	7,327	,,
St. George's Hospital ...	12	,, ,,	11,804	,,
St. Bartholomew's Hospital	8	,, ,,	17,757	,,
Mayo Clinic	47	,, ,,	63,573	,,

This gives an incidence of rather less than one fatal case per 1,000 operations. The Adelaide Hospital figures show 2.5 per cent. of the post-operative deaths as due to pulmonary embolism, while St. Mark's Hospital shows 5 per cent. of the deaths as due to this disaster.

Cases of Recovery.—When a pulmonary embolus occurs the dangerous period is during the first few minutes, and as a rule if the patient can survive for ten minutes he will recover, provided that secondary pneumonia does not supervene. In the non-fatal cases the dyspnoea soon passes off and the pain in the chest, which is at first acute, subsides. The temperature generally rises in the course of a few hours following the onset to 100° or 101° F., and a cough develops in the course of the next day or two. During the next few days the patient may bring up blood-stained sputum. Examination of the chest as a rule reveals an area of dullness and tubular breathing and sometimes friction sounds. These sounds may be absent if the infarction is not near the surface and is small in area. The symptoms generally pass off within a period varying from a week to ten days. The distinction from ordinary pneumonia lies chiefly in the character of the onset. In embolism or infarction the first symptom is always pain, and the temperature does not go up until afterwards, nor are there any previous signs of illness. In pneumonia, on the other hand, the rise of temperature occurs first, as a rule, and the dyspnoea is a comparatively late symptom. Also in pneumonia the temperature is much higher and the illness much longer.

We may divide cases of pulmonary embolism into three categories:

(1) Cases in which death occurs instantaneously and without premonitory symptoms.

(2) Cases in which death occurs in a few minutes or hours following an acute and sudden crisis, characterized by dyspnoea and pain in the chest.

(3) Cases in which the patient, after a similar crisis, develops signs of consolidation of part of the lung and recovers.

Cases of Instantaneous Death.—In such cases death takes place without warning in a few seconds. A patient, aged 51, at St. Mark's Hospital, woke up in the morning ten days after an operation for excision of the rectum, and, while speaking to the nurse, died while in the middle of a sentence. There were no premonitory symptoms at all. I think it is certain that such deaths as this must be due to a detached clot reaching the medulla of the brain, as it seems impossible that a normal heart would stop so suddenly as the result of blocking the pulmonary artery.

I have always thought that these cases must be due to pulmonary thrombosis, and a portion of the clot detaching and being swept through the pulmonary veins into the heart, and thence to the brain via the carotids. It is, of course, obvious that a clot from the inferior vena cava could not reach the brain unless there was a patent ductus arteriosus. There is, however, a specimen in the London Hospital museum showing such a condition, but it could only account for a small number of the cases. Valve thrombi may also account for cerebral embolism, but *post-mortem* examination has only very rarely demonstrated their presence. Among the cases collected at the Mayo Clinic by Wilson 20 per cent. were cases of cerebral embolism. It was this fact which led me to the conclusion that primary pulmonary embolism must occur. When I wrote my former paper on this subject I made a number of inquiries among pathologists as to whether they had seen cases of primary pulmonary thrombosis, but although I felt assured that the condition must exist I could find no certain evidence of it. I was therefore particularly pleased when I read Professor Glynn's paper (BRITISH MEDICAL JOURNAL, February 23rd, 1924, p. 323), in which he brought forward proof that primary pulmonary thrombosis does exist. He has, I think, shown beyond doubt that pulmonary thrombosis is a definite entity, and thus we have a satisfactory explanation of these cases of cerebral embolism.

Symptoms of Pulmonary Embolism.

When the area of lung involved is small the dyspnoea is only temporary and soon passes off. On the other hand, when a large area of the arterial field in the lungs is suddenly blocked the dyspnoea is very acute and accompanied by all the symptoms of great cardiac distress. The dyspnoea is not due to the fact that part of the lung is put out of action, but to the strain put upon the heart by the sudden limitation of the area of pulmonary circulation. It is not the sudden reduction in the breathing surface, but the obstruction to the circulation of blood between the right and left auricles, which causes dyspnoea. It is the sudden strain on the heart which causes death, and not the limitation of the ventilating surface. This cannot be generally recognized, as the usual treatment is to administer oxygen or a stimulant such as strychnine when a patient first gets signs of a pulmonary embolus. This is wrong, as it is useless to kick a willing horse. The heart is straining against a very sudden and serious obstruction in the arterial field from the right ventricle and it is in danger of dilating from the strain; stimulants only increase this difficulty. What is indicated is to try and relieve the pressure in front of the heart by dilating the vessels as far as possible, and for this purpose amyl nitrite is probably the most valuable drug, or in its absence atropine and morphine should be administered, but stimulants should be avoided.

Pathology.

When a portion of loose clot passes into the right side of the heart it is driven into the pulmonary artery. If large enough it may block the main pulmonary artery at its bifurcation, or it may obstruct either the right or left pulmonary arteries, thus completely blocking off the blood from an entire lung. Such an embolism almost certainly causes death in a few minutes from the strain thrown upon the heart. If the clot is not very large it passes further into the lung and blocks one of the smaller pulmonary arteries and arrests the circulation in a cone-shaped portion of lung corresponding to the distribution of the artery concerned. The condition thus produced is called an infarct. It produces signs of localized pneumonia, but is seldom fatal. It seems certain that clots cannot pass through the lung capillaries, but it must be concluded that fat emboli can do so, since fat emboli in the brain are well known to result from fractures of the bones, and the only channel by which the fat can reach the brain is by way of the lungs. Fat is a fluid and probably passes easily through the lung capillaries. Emboli may lodge in the coronary arteries, and one such case is included in the figures from the Mayo Clinic. Such cases are probably very rare, but will account for some of the cases of instantaneous death.

It is, of course, obvious that pulmonary embolism is a secondary condition, and that the primary and important one from the point of view of this discussion is the formation of the primary intravascular clot. It is only in a few cases that we have any evidence of the situation of the primary clot. When such evidence is available it generally shows that the primary clot is in the internal or external iliac veins, or at the point when they join to form the inferior vena cava (see Diagram 1). In some cases the inferior vena cava has been found lined with clot. Many writers have assumed that the clot originated at or near the area of operation, but no proof of this has been discovered *post mortem*.

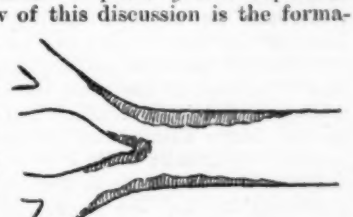

DIAGRAM 1.—Showing how clot forms on the wall of the inferior vena cava and iliac arteries from venous stasis.

In considering where the embolus comes from it is important to remember the anatomy of the veins. One writer,

for instance, said that he believed ligaturing portions of the omentum by transfixion was liable to result in embolism, forgetting that the omental veins drain into the liver (see Diagram 2).

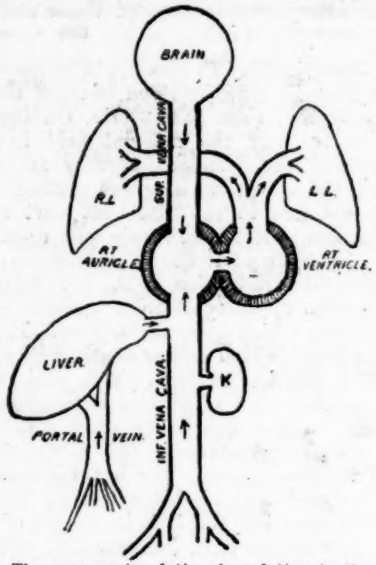

DIAGRAM 2.—The venous circulation in relation to the formation of pulmonary embolism.

The following table of fatal cases, taken from the Mayo Clinic, showing the operations most commonly followed by pulmonary embolism, is of particular interest.

Site of operation.	No. of deaths.
Thyroid	2
Mouth	1
Stomach	3
Gall bladder	9
Small intestine	1
Appendix	4
Colon and rectum	5
Hernia	5
Kidney	1
Prostate	4
Uterus and appendages	10

N.B.—The operations in italics were in areas drained by the portal vein.

The embolus was—

Pulmonary in	36 cases
Cerebral in	10 ,,
Coronary in	1 case

You will notice that a large proportion of the operations were performed upon parts of the alimentary canal which drain into the portal veins. In fact, operations upon the gall bladder, stomach, and appendix, all of which have their veins draining into the portal veins, account for over half of the cases. Yet the embolus which caused death passed into the right auricle and plugged the pulmonary artery. The clot therefore did not form in the operation area, but almost certainly in the iliac veins or vena cava.

The obvious conclusion from these facts is that the primary clot forms in the vena cava, or its branches, quite irrespective of the operation area, and is due to stasis in the great venous trunks rather than to any injury of contributory veins. Another important point is the marked difference as regards liability to post-operative emboli between the upper and lower parts of the body. Any study of cases of post-operative pulmonary embolism will show that in almost all the cases the operation has been upon the abdomen and lower limbs. Thus, in only 3 out of 47 cases at the Mayo Clinic was the operation area in the upper part of the trunk; while in 9 cases at the Adelaide Hospital all were due to lesions in the lower part of the trunk.

Operations on the breast, head, neck, and arms are common enough, and yet are very rarely followed by pulmonary embolism. Why is this? I believe the explanation to be that operations upon the upper part of the body do not tend to cause such a degree of venous stasis in the cava as operations upon the abdomen. Venous stasis cannot occur in the superior vena cava, as a free flow of blood through the brain is essential to life. The brain is the controlling factor, and the vasomotor centre will starve the rest of the circulation if necessary in order to maintain an adequate circulation through the carotids and superior vena cava.

The fact that operations upon the pelvic organs more frequently result in pulmonary embolism than operations on other parts has called for many different theories in explanation. It has been suggested that pelvic operations are more liable to result in injury to large veins. It has also been pointed out that there are no valves in the ovarian veins; but there is no evidence that valves, even when present, have any influence in arresting the spread of thrombosis. A much more reasonable explanation, it seems to me, is that operations upon the pelvic organs tend to a greater degree of immobility both during and after the operation than operations elsewhere. The position of the patient during most pelvic operations, and the presence of retractors and packs in the pelvis, must tend to arrest the circulation in the inferior vena cava, both by direct pressure and by interfering with the action of the diaphragm, which, as you know, is most important in aiding the flow of blood in the abdominal veins.

As I have already pointed out, operations upon the areas of the abdomen drained by the portal vein account for more cases of pulmonary embolism than operations on the pelvic organs (see Diagram 1), and it cannot be suggested that injury to the branches of the portal vein can cause a pulmonary embolism.

A further argument in favour of venous stasis as the chief cause of post-operative pulmonary embolism is that we find it is more liable to occur in patients whose circulation is poor—as, for instance, in cases where there has been loss of blood, in anaemic persons, and those suffering from chronic toxaemia. The conditions predisposing to venous stasis are immobility of the lower part of the body in a constrained position, a poor circulation such as is present in a patient with anaemia, and an open abdomen which will do away with the effect of respiration upon the abdominal contents. If we add to these the pressure of packs and retractors in the abdomen, and a certain degree of haemorrhage, it is not unlikely that a considerable degree of stasis occurs in the inferior vena cava and iliac veins during operations upon the pelvic and abdominal organs.

When fluid is flowing through a channel or pipe the stream is fastest in the centre of the channel and slowest at the sides. This can be observed in any river, and is equally true of the inferior vena cava. If for any reason the flow is considerably slowed there may be complete stagnation of the flow against the walls of the channel, although a fair current is still maintained in the centre (see Diagram 3). This stagnation will be accentuated at places where side channels come in, as there would be a tendency to the formation of back eddies at the corners. This is what I conceive occurs in the inferior vena cava during certain operations.

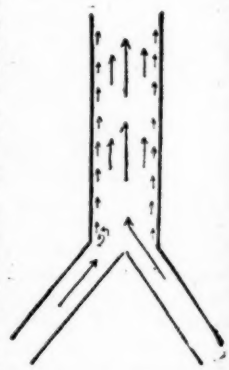

DIAGRAM 3.—Showing how the current is slowed near the walls of the inferior vena cava.

If we grant that venous stasis is the most important predisposing cause of pulmonary embolism, it will explain many of the facts. It explains why abdominal and pelvic operations account for the vast majority of cases. It explains why patients with anaemia or with abnormalities of the blood or circulation are more liable to pulmonary embolism. It also explains why children do not appear to suffer from embolism after operation. It is never seen in children, no doubt owing to their more active circulation, which does not allow of stasis in the veins. Children suffer from pneumonia after operations, but it is always of the bronchopneumonic type.

Sepsis.

There is a very prevalent belief that embolism is due to sepsis. I cannot accept this belief. The majority of cases followed by pulmonary embolism are clean cases in which there is no evidence of sepsis at all. Beckman, in his review of 6,825 operations, came to the conclusion that sepsis cannot be the cause of thrombosis. This is also confirmed by the figures of the Chelsea Hospital, where only one case out of nine was definitely septic. Some

surgeons say that embolism results from a mild form of sepsis unaccompanied by the breaking down of the wound. This, surely, is merely begging the facts. If sepsis is the cause of the condition the secondary focus caused by the embolus becoming arrested should become septic, and they would have a pyaemia. This is, however, not the case; true, a secondary pneumonia often develops, but this is not as a rule a septic pneumonia, but a pneumonia due to the ordinary pneumococcus having been able to obtain entry to the damaged lung. Moreover, the time at which the embolus occurs does not fit in with its being due to sepsis. Embolism sometimes occurs within a few hours after operation, which would seem to be altogether too soon. On the other hand, in not a few cases it does not occur for three weeks, or even longer. I have notes of one case in which an infarct formed three weeks after a simple laparotomy which had healed by first intention, of another case in which a fatal embolism occurred six weeks after a normal confinement, and Wilson records a fatal case of embolism nine weeks after operation. We have to remember that septic wounds are usually more painful than non-septic wounds, so that the patient probably keeps much quieter. Further, the patient's general health is lowered, and blood changes probably occur which encourage the formation of intravascular clotting. In these ways I believe sepsis is a contributory cause, but I am certain it is not the direct cause.

It seems at present impossible to determine what, if any, is the exact relationship between sepsis in the wound and post-operative embolism and infarction. There is no proof that the presence of septic organisms, or their toxins, in the blood induces intravascular clotting; and, on the other hand, septic diseases which are not the result of wounds, such as whitlows and abscesses, sapraemia, scarlet fever, etc., are not complicated by emboli and infarcts. We are, however, still very much in the dark as regards the exact morbid physiology of phlebitis.

A further argument against sepsis being the cause of the condition is that it will not account for cases of embolism following such operations as simple laparotomy, hernia, interval operation for appendicitis, or operations for piles. Moreover, it will not account for the cases of crossed thrombosis. It is not uncommon to find thrombosis occur, for instance, in the left saphena vein or femoral vein, after an operation on the right side, or vice versa. On looking through the records of cases of embolism one is struck by the fact that in quite a number of cases thrombosis in the leg has been present, either before the occurrence of the embolus or afterwards, and that this thrombosis is not always on the same side as the operation where the latter is unilateral.

When a thrombosis occurs in one of the veins of the lower limbs it is naturally detected, but obviously if thrombosis occurs in one of the pelvic or abdominal veins it is not likely that this could be detected unless it is able to cause such an arrest of the circulation as to produce swelling in one of the lower limbs, or other signs of inadequate venous circulation in the parts drained by that vein. Quite extensive thrombosis may take place within the abdomen without producing any obvious signs of its presence in a recumbent patient. It is true that it would almost certainly cause pain, as pain is always a first symptom of thrombosis, but as the pain would be referred to some part of the abdomen its real cause may easily be overlooked; in fact, in looking through the notes of some of the cases of embolism I find that in several it is stated that vague pains in the abdomen have been complained of by the patient before the occurrence of the embolism.

It seems to me that all the evidence points to venous stasis in the large veins of the abdomen as the chief factor in producing pulmonary embolism after operations, but when we turn to the experimental side of the subject we come up against a serious difficulty. Venous stasis cannot be the only cause as there is no evidence that mere recumbency or lack of movement will result in thrombosis, apart from operation. Embolism does not occur after rest cures or in paralysed persons who have lain in bed for months, or even years. Obviously were mere venous stasis the cause we should be liable to get thrombosis and embolism as the result of normal sleep. The physiological proof that mere venous stasis does not cause thrombosis is of very ancient date; over one hundred years ago Hunter proved that intravascular clotting does not take place in an intact vein, even when both ends are ligatured. His now famous "living test tube" experiment was made by tying at both ends six inches of the jugular vein of a horse. He found that the blood was still fluid at the end of six days.

The physiologists have shown that in order to produce clotting of the blood a substance called thrombokinase must be present in contact with it. This substance, thrombokinase, is not present in the blood, but is found in varying quantities in all the other tissues of the body, and a certain quantity is liberated whenever a wound is made. It is the contact of the escaping blood with the thrombokinase present in the wound tissues that determines the formation of the clot which seals up the vessels after a cut has been made. The change which takes place to produce a clot when thrombokinase comes into contact with blood may be expressed as follows:

Thrombokinase + a calcium ion + thrombogen (normally present in the bood) = thrombin.
Thrombin + fibrinogen (present in the blood) produces fibrin (clot).

Thrombokinase introduced into a vein produces intravascular clotting if the blood is stationary, but apparently fails to do so if the circulation is active.

Recently Professor Collingwood has shown that intravascular clotting does not follow the intravenous injection of thrombin even when injected in relatively enormous quantities, *if the blood is in a condition of movement or circulation*, although the amount of thrombin injected is actually sufficient to clot every drop in the animal's body if removed from the vessels.

It has been stated that increasing the calcium content of the blood would cause intravascular clotting, but more recent work has proved this not to be the case. The amount of calcium present in the blood is the maximum required, and the addition of more calcium tends to reduce the clotting capacity rather than to increase it.

It would seem, therefore, that before a thrombus can occur two factors must be present:

(1) A certain amount of thrombokinase, derived from the tissues and liberated by the wound, must be present in the blood, but the amount would appear to be very slight.

(2) There must be venous stasis.

Neither factor alone can produce a thrombus, but both must be present at the same time. (N.B.—The reason why intravascular clotting occurs when a vein is damaged, or inflamed, is that thrombokinase is liberated at the point where the intima is damaged.)

The sequence of events seems to be somewhat as follows: As the result of the wound, thrombokinase is liberated from the tissues and passes via the lymph stream into the circulation (or possibly passes direct into the vein); this enables a clot to form in those veins in which the blood is for the time being stagnant, or nearly so.

Time when the Thrombus Occurs.—We have in any given case of pulmonary embolism only got evidence of the time when the clot separates and sticks in the pulmonary artery; obviously the thrombus which formed this clot, or from which it has broken off, must have formed much earlier, but there is no means of ascertaining when this occurs. It seems to me that everything points to the conclusion that the original thrombus formed on the walls of the veins during the operation, and that it spreads during the period of quiescence immediately following the operation. The danger period is in fact the time of operation, and at any period after this, from a few hours up to many weeks, a portion may become detached and produce an embolus, the subsequent result depending on the size of the embolus, the part of the circulation in which it starts, and where it becomes arrested.

My theory of pulmonary embolism is that the operation predisposes to the condition in two ways: it results in the liberation into the circulation of thrombokinase from the cut surfaces, and at the same time tends to produce venous stasis near the walls of the great veins. If these two conditions occur in a sufficient degree a thrombus forms and the train is laid for a pulmonary embolism at a later

period. I do not think that sepsis is at all an important factor, if it is a factor at all. I think for once sepesis may be found not guilty.

Treatment.

At present there is no known means of ascertaining when a thrombus has formed in the great veins, and much less is there any means of treating it. We might, it is true, take steps to reduce the coagulability of the blood of the patient previous to operation, but I do not think that this would meet with the approval of the surgeons, as it would be liable to result in equally serious disasters of another kind.

Trendelenburg has suggested operating in order to remove the thrombus from the pulmonary artery, and there are records of this being done, but it does not seem sound, as patients who have survived a pulmonary embolism long enough to undergo an operation will probably recover anyway. It is to prevention rather than cure that we must look if we want to get rid of the mortality after operations from pulmonary embolism.

The present methods of anaesthesia, which include a preliminary injection of morphine, probably tend to encourage thrombosis by slowing the blood stream during the dangerous period. This possibly explains the greater frequency of cases of embolism during the last ten years, as compared with the time when most patients were given gas and ether, with consequent vomiting as soon as they had left the table.

The best method of preventing patients from getting post-operative thrombosis does not consist in altering the technique of operations, but rather in altering the methods of preparation and of after-treatment. Preliminary purgation of the patient should be entirely abolished; if necessary it should be carried out five or six days before operation. The practice of starving the patient both before and after operation should be discontinued. The supply of proper mattresses on the tops of operating tables, and the prevention of the patient assuming a constrained position during the operation which would cause pressure upon the veins, are points requiring greater attention. The frequency of embolism after gynaecological and gall-bladder operations is possibly attributable to the unnatural positions in which the patients are placed. I think we should attach more importance to the comfort of the patient on the operating table than we do at present. The patient being under an anaesthetic we not unnaturally consider our own comfort and the accessibility of the operation area in placing the patient on the operating table, and do not think that the patient may for an hour or more be in a most constrained position, which will embarrass the circulation in the lower limbs and pelvic veins.

Although the subject is such a difficult one and the means of preventing embolism are so uncertain, it is, I think, a great thing that surgeons have at last begun to try and find out the cause of the condition and to inquire how they may prevent this dreadful complication. The fact that they are no longer satisfied to accept pulmonary embolism as an act of God, but are anxious to try and ascertain what fault of their own it is that causes it, is a great step in the right direction, and I feel sure that the number of cases of pulmonary embolism in the next ten years will be much reduced.

DISCUSSION.

Sir Charles Gordon-Watson (London) said that with the steady progress in surgical technique post-operative risks had steadily diminished, and in the up-to-date clinic team work had wiped out the risks of sepsis. The abolition of drastic purging and starvation before operation, the introduction of gas-oxygen anaesthesia, gentler handling of the tissues, and the revival of whole-blood transfusion had reduced the risks from shock to a minimum. Yet the bogy of embolism with its tragic suddenness remained unchecked, and, if they might draw conclusions from limited statistics, was actually on the increase.

This risk, as Mr. Lockhart-Mummery had stated, was probably not more than 1 in 1,000 operations. A fair idea of the incidence might be gathered from the following figures, obtained from the surgical necropsy records at St. Bartholomew's:

1912-13-14: Operations, 10,604; necropsies, 594. Deaths from pulmonary embolism, 3 = 0.5 per cent. Average age, 52.
1919-20-21: Operations, 9,558; necropsies, 538. Deaths from pulmonary embolism, 9 = 1.7 per cent. Average age, 60.
1922-23: Operations, 8,839; necropsies, 358. Deaths from pulmonary embolism, 10 = 2.79 per cent.
Total operations, 29,001. Deaths from pulmonary embolism, 22.

These figures indicated that at St. Bartholomew's Hospital pulmonary embolism was on the increase, but the series was too small for general conclusions to be drawn. Mr. Lockhart-Mummery, however, had arrived at a similar conclusion from his study of collected cases.

He thought it would be helpful to draw a distinction between massive pulmonary embolism and pulmonary infarction; he did not propose to discuss pulmonary thrombosis. Pulmonary infarction followed the detachment of a small particle of clot, and was liable to be multiple and recurrent. Pulmonary embolism could only occur when a massive clot was detached and became impacted in the main pulmonary artery. When thrombosis occurred as a result of active inflammation, the clot became firmly fixed to the vessel wall, and was not likely to become detached *en bloc* except in the very early stages. If suppuration began the clot would soften, and fragments were then liable to be detached and carried off into the blood stream, causing infarction. Detachment of a large, recently formed, firm clot would seem to be less likely to occur when the wall of the vein was inflamed than when the wall was relatively smooth and a clot formed as the result of stagnation rather than inflammation.

He agreed with Mr. Lockhart-Mummery that in most instances of pulmonary embolism passive clotting had occurred in the large veins in the pelvis under certain favourable conditions during operation or quite early after operation. These clots remained for some time loosely attached to the wall of the vein, and were easily detached by sudden movement, active muscular contraction, or sudden acceleration of the heart's action. The fifth to the tenth day was the most likely period for this accident to occur. Though the majority of these emboli could be traced to an origin in the iliac or femoral veins, others had their origin in the right auricular appendix. In most instances, prior to a massive embolism, thrombosis had been neither observed nor suspected. Phlebitis, with pain and swelling of the limb, seldom preceded this sudden catastrophe. In the great majority of the cases there was no preceding rise of temperature, nor was there any feature in the clinical course to sound a note of warning of an impending disaster. On the other hand, in many cases of pulmonary infarction the post-operative pulse, temperature, and respiration often failed to settle down to normal. The surgeon might recognize that, without any definite explanation, the patient was not quite so fit as he ought to be, even though there was no evidence of phlebitis. In many instances when pulmonary infarction occurred a low grade of inflammation in connexion with the wound or with phlebitis preceded the onset.

Excluding post-operative infection, what were the controlling factors in post-operative thrombosis? Thrombokinase, as Mr. Lockhart-Mummery suggested, when released at operation and absorbed into the blood might be the exciting factor in thrombosis under favourable conditions. If they assumed that thrombosis might occur in a sluggish venous current when thrombokinase was present in the blood, what other factors, if any, were essential? Was trauma essential? Though, as Mr. Lockhart-Mummery had pointed out, Hunter failed to secure intravascular clotting in an intact vein, it might be quite possible for a thrombosis starting in a small vein ligatured, crushed, transfixed, twisted, or torn during operation, to extend and invade a healthy vein. Might not injury to the deep epigastric veins—for example, by retractors—give rise to thrombosis which might spread to the external iliac vein, or injury to uterine veins excite a thrombosis which might invade the internal iliac? Unnecessary injury to veins in the abdominal wall during an operation might be caused by

violent stretching and undue pressure with powerful retractors. Transfixion of the pedicle containing large veins, as in the broad ligament, clamping of structures in bulk as opposed to clamping of individual vessels, and twisting of veins were points worthy of consideration in this respect also. The application of forceps, followed by the ligaturing of small venous branches close up to their junction with a large vessel, might result in injury to the wall of the main vessel beyond the site of ligature. The presence of a haematoma in the abdominal wall might be the cause of thrombosis in one of the epigastric veins. In a fatal case of pulmonary embolism at St. Bartholomew's after an operation for hernia, a haemorrhage in the inguinal area had produced pressure on and thrombosis in the femoral vein. Haemorrhage into the tissues of the broad ligament or the mesentery might, by producing pressure on the iliac veins, start a thrombosis. When a needle pierced or wounded a vessel, or when the lining of a vessel was injured by torsion, if a ligature was not applied above the point of injury thrombosis might easily occur in a sluggish blood-stream. Septic pulmonary infarction was a very common complication of war wounds and one of the common causes of a fatal issue, but massive pulmonary embolism was by no means common. The fact that nearly all wounds were primarily infected, and phlebitis was a very common complication while massive pulmonary embolism was rare, was presumptive evidence that sepsis played an unimportant part in pulmonary embolism, as distinct from infarction.

The factors responsible for a sluggish circulation might be grouped under the following headings:

(A) *Loss of Fluid.*—(1) Before operation by purging; (2) during operation by haemorrhage and sweating; (3) after operation by vomiting, and the limitation of fluid by the mouth or rectum.

(B) *Loss of Blood Pressure.*—(1) Through post-operative shock; (2) prolonged anaesthesia, especially chloroform; (3) by injection of morphine before and after operation; (4) by a recumbent fixed position after operation with a minimum of movement and muscular action of the lower extremities; (5) by diminished respiratory effort during convalescence in recumbency.

(C) *The effect of posture during operation* on the return of blood through the inferior vena cava.

It was difficult, if not impossible, to show to what extent, if any, the factors enumerated under these headings might be contributory causes, but it was clear that all of them were more or less under the control of the surgeon, and it seemed at least reasonable to argue that much might be done on these lines to prevent the onset of passive thrombosis. For the past four years he had had respiratory exercises followed by massage carried out in his wards after abdominal operations, and he allowed patients to move about in bed and to get up very much earlier than he used to do. He had no doubt that preliminary and excessive purging immediately prior to operation was a factor in the production of post-operative shock. Many a gallant soldier must owe his life to the fact that he was operated on in a casualty clearing station where there was neither time nor inclination to purge him!

So far as the posture at operation was concerned, it was interesting to note that operations on the pelvic viscera were responsible for more pulmonary embolisms than any other class, and that gall-bladder operations stood very high in the list. The following questions might be asked in this connexion: Did the constrained and tilted position of the spine, often adopted during operations on the gall bladder, kink the inferior vena cava and obstruct the return of blood? Did the high Trendelenburg position, by upsetting the normal position of the heart, act in a similar manner, causing undue pressure of the ventricles on the auricles and so on the inferior vena cava, and did not this position often produce pressure on the popliteal veins?

The clinical picture of pulmonary embolism was too distinctive and dramatic to escape recognition during life, but the embolus might sometimes escape detection after death if the heart was severed from the lungs before the pulmonary artery had been opened. He had seen an embolus drop out in this manner. When death occurred from pulmonary embolism an *ante-mortem* laminated clot was found usually coiled up at the pulmonary inlet and projecting into one or both main branches. The surface of the clot when inspected closely had a finely granular appearance, it was firm to the touch, and showed no sign of breaking down. It was often branched when it arose from the internal iliac. If the pulmonary artery was opened with the heart *in situ*, the embolus could usually be removed intact, and might be many inches long when unravelled. On one occasion, when surgical registrar at St. Bartholomew's, he had found in a case of fracture of the leg a firm clot in the internal iliac which came to an abrupt and irregular termination at its junction with the external iliac. He removed a curled-up embolus from the pulmonary artery, and found that it accurately fitted on to the existing clot and had obviously been broken off by the current of blood from the external iliac vein. In that case, there was no femoral phlebitis or thrombosis in relation to the fracture.

The lungs of a patient who died of sudden pulmonary embolism showed oedema and congestion. Such congestion would be more pronounced in a lung when the artery was completely blocked than when partly blocked, and would vary in intensity with the duration of life after the block had occurred. Under normal conditions the pressure on the outside of the capillaries in the lung was negative. When forced inspiration occurred after blocking of the pulmonary artery, it was probable that blood was sucked back from the left auricle via the pulmonary veins into the pulmonary capillaries and stagnated there in the absence of any flow of blood from the pulmonary artery. In that way much blood was withdrawn from the general circulation, an important factor in the shock which occurred. Signs of infarction were absent, unless a fatal embolism had followed on a previous infarction.

The right heart even in sudden death under these conditions was found dilated, and there was little doubt, as Mr. Lockhart-Mummery had stated, that the main cause of death was heart failure from dilatation of the right ventricle, though shock was an important additional factor. One element in the shock was probably the withdrawal of a considerable volume of blood from the systemic circulation by stagnation in the pulmonary area, and another was the fear of impending death so commonly noted in these cases.

With regard to prophylaxis, Sir C. Gordon-Watson remarked that by gentleness in operating they might avoid unnecessary trauma and eliminate an important exciting cause; by the careful control of haemorrhage they might check the absorption of thrombokinase, and avoid thrombosis due to pressure from a haematoma. If they did not reduce a patient to pulp before operation, allow him to bleed at operation, or fail to be generous with fluid after, they should at any rate not impoverish his blood supply. If they avoided constrained positions at operation and fixed positions after, if they stimulated respiratory and muscular effort during convalescence, they should do no harm and would perhaps avoid disaster.

Once an embolism had occurred he was in thorough agreement with Mr. Lockhart-Mummery on the importance of relieving the great strain on the heart with amyl nitrite and combating the shock by morphine. He was present on one occasion, in a private house, within a few minutes of the onset of an attack. With the aid of morphine and oxygen (amyl nitrite was not available) he reduced the mental distress and slowed down both the heart and respiration, but he could not overcome the asphyxia or change the ashen-grey hue, which was a combination of the pallor of shock with the blue of deficient oxygenation; nor could he prevent the ultimate heart failure which occurred just over two hours after the onset. On another occasion, in a case of abdomino-perineal excision, the house-surgeon of St. Mark's Hospital kept the patient going with continuous oxygen from 11 a.m. to 7 o'clock next morning. It was unusual for a patient to survive so long and not recover, and he thought it was probable that had morphine and amyl nitrite been employed the heart might have been equal to the strain while the pulmonary circulation was becoming adjusted to the altered conditions. The late Professor Bainbridge, shortly before his death, had commenced a research on this subject, and had obtained some interesting results from the ligature of one pulmonary artery in the cat. Was it too much to ask of the British Medical Association to devote a sum of money to research in this subject, which had so long baffled surgical science?

Professor J. Shaw Dunn (Manchester) said that in his general survey of the subject Mr. Lockhart-Mummery had shown that, as a sequel to modern operative procedures, pulmonary embolism was a comparatively infrequent occurrence, and he had also offered some evidence that even when it did occur it was not usually attended by a fatal result. In agreement with this it might be said that in the *post-mortem* room pulmonary embolism was relatively seldom found to be the cause of post-operative deaths. Still, such cases did appear from time to time, and the circumstances of their occurrence as revealed in the clinical notes were usually of a sufficiently tragic character to excite considerable interest and to lead to an intimate inquiry into their causation. If attention was restricted to immediately fatal cases the morbid appearances were found to be fairly uniform: an elongated mass of dark-red clot was found coiled up and impacted in the bifurcation of the main pulmonary artery or in one of the main branches. When this was being looked for it was essential to open up the right ventricle and pulmonary artery before the thoracic organs were disturbed in any way, for in some instances the clot was sufficiently loosely held to slip out from its significant situation, and thus left the nature of the condition in doubt. In a typical example of the kind the cause of death was not in question, for there was ample evidence of a sudden arrest of the circulation as a whole.

The important question that did arise, as Mr. Lockhart-Mummery had pointed out, was that of the original site of the thrombus. Having in mind the importance of circulatory stasis and of damage of vascular endothelium in the promotion of thrombosis, it was not unnatural that this site should first be looked for in some large vein near the operation area, where tissues had been more or less injured and vessels had probably been tied. In what proportion of instances the thrombus did come from this area it was impossible to say; but in his own experience of seven or eight cases it had always been traced thither when sufficient care had been taken in dissection of the wound. When the larger veins, of a size which could have accommodated the fatal embolus, had been opened up they had been found to be empty; this was to be expected, for if the thrombus had remained *in situ* the patient would not have died of pulmonary embolism. But at some point on the wall of the large vessel, or often protruding into it from the opening of a small tributary, there might be found a tiny tag of formed thrombus, the broken end from which the large mass had become detached. Further examination of small veins might readily reveal a greater extent of thrombus still *in situ*, but sometimes the amount remaining was not large.

The next question of vital importance was, of course, why massive thrombosis of this type occurred in some cases and not in others. To this question it was evident that the experience of different observers had led to varying answers. Mr. Lockhart-Mummery regarded the part played by sepsis as insignificant, but with that conclusion there must be many, surgeons and pathologists alike, who would fundamentally disagree. In support of this statement reference might be made to a discussion by the North of England Obstetrical and Gynaecological Society of a paper by Professor Glynn on pulmonary embolism and thrombosis.[1] Considering for a moment the condition of frankly declared septic infections, one could not but recognize how frequently thrombosis was an associated phenomenon: there was the familiar development of cerebral sinus thrombosis in otitis media, where a suppurative focus impinged directly on a large venous channel; the thrombosis of iliac veins in relation to septic uterine disorders; and of the portal vein to appendicitis or other septic focus in the intestinal tract. Not only did sepsis have as one of its serious consequences the development of local thrombi, but the general poisoning of the system might result in the formation of *ante-mortem* clots in the heart itself, as was commonly seen at the termination of pneumonias, but also in surgical forms of septic infection.

It was no doubt perfectly true that in cases of post-operative pulmonary embolism there was not as a rule gross and frankly declared septic infection of the surgical wound, but infection of some degree could frequently be found—so frequently that one was inclined to believe it invariable. In illustration of the type and extent of wound infection which could determine fatal embolism it might be permissible to refer briefly to two cases.

Case I.—A woman, aged 69 years, had the left mamma amputated, and after the operation appeared to be making an entirely satisfactory recovery. When allowed to sit up twelve days after the operation she fell back and died in a few seconds. At the *post-mortem* examination the superficial wound appeared quite satisfactory, the skin incision having healed. A large elongated cylindrical thrombus was found coiled up in the bifurcation of the main pulmonary artery, completely blocking both branches. The imprint of valves was clearly visible on this thrombus, leaving no doubt that it had been transported from a vein. The left subclavian vein when slit up was found patent and normal, except that a small ragged mass of reddish-yellow thrombus was found adherent to its wall at the orifice of a branch which entered from the region of the mammary wound. This small vein contained similar solid material in the rest of its extent. When the amputation wound was opened up it was found to be dry and healing anteriorly, but in the posterior part the tissues were oedematous and slightly turbid fluid exuded from them on pressure. Polymorphonuclear leucocytes and streptococci were found in this fluid on bacteriological examination.

Case II.—A young woman had varicose veins removed from the right leg and thigh by dissection. The long skin wound was completely closed by sutures and healing appeared to proceed normally, but the patient died suddenly about a week after the operation. After death a coiled embolus was found in the pulmonary artery. An examination of the operation wound revealed perfectly natural healing conditions in the skin and subcutaneous tissues, and it appeared as if for once some other explanation than local sepsis must be sought to account for the fatal embolism. It was only when a close inspection was made of the stump of the internal saphenous vein that the ligature on this vessel was found to be bathed in sanious fluid in which streptococci and polymorph leucocytes were subsequently demonstrable by films. On the inner aspect of the venous stump there was present a thin, ragged layer of thrombus from which, no doubt, the embolus had broken away. The recognizable septic focus was in this case extremely limited, being less in size than a pea, but it occurred just on the wall of a large vein, where it was most liable to produce a serious result.

In other cases of the same type to which reference might be made the evidences of wound infection were usually rather more obvious though never very advanced, and the impression that remained from a consideration of all of them was that all cases of post-operative pulmonary embolism were suspect of being derived from sepsis unless cleared of this suspicion by a most thorough investigation.

Professor Ernest Glynn, associated with Dr. Maurice Cohen, detailed the evidence that primary pulmonary thrombosis was a cause of sudden death, and was more frequent than pulmonary embolism. Stasis and mild sepsis were two main factors in the production of the thrombosis. Stasis could be diminished by post-operative exercises, including deep breathing.

Mr. James Berry (London) confined his remarks to post-operative pulmonary embolism. He thought that this was due in the main to the bad practice, still much too common, of keeping patients quite quiet in bed for days or weeks after operation. In the case of operations upon parts above the diaphragm, such as those for carcinoma of the tongue and large operations of all kinds upon the neck, there were but very few patients who could not with advantage be got out of bed on the first, or at latest on the second, day after operation. This had been his practice for many years, and he had not yet seen embolism after any such operation. Nevertheless, he well remembered being solemnly warned some twenty-five years ago by a senior colleague that this practice was highly dangerous, and that it would result in the occurrence of embolism, this being the view that was generally held at that date. In the case of operations on the abdomen, pelvis, and lower limbs it was, of course, impracticable to get the patients out of bed quite so early. Nevertheless, much might be

[1] British Medical Journal, February 23rd and April 19th, 1924, pp. 323 and 712.

done in such cases to prevent the occurrence of embolism by letting the patient sit up in bed at a very early stage, by encouraging him to turn from side to side and to move his legs and arms (unless actually the seat of operation). Such treatment prevented stasis of blood in the larger veins and the dangerous formation of large passive clots, which in turn led to embolism.

He could not remember having had more than one fatal case of embolism after this class of operation. This was the case of a woman operated upon for varicose veins and who had, erroneously, been kept in bed much too long. She died quite suddenly of embolism as she was leaving the hospital. Another contributory cause of embolism, especially after pelvic operations, was, in his opinion, the blind transfixion of tissues with ligatures. Ligatures passed in this way could easily be made inadvertently to transfix pathologically enlarged veins, and, without causing noticeable haemorrhage, create a focus for the subsequent formation of a clot, thus leading to embolism.

Mr. Harold Burrows (Portsmouth) referred to two cases in which pulmonary embolism followed thrombosis of varicose veins in the calf of the leg. In both instances the patients had been treated by splinting and absolute immobility, and the occurrence of fatal embolism in these conditions seemed to lend support to the suggestion that strain played a part in the causation of the thrombosis.

Sir Cuthbert Wallace (London) thought that Professor Glynn had rendered great service in bringing forward the question of the part played by pulmonary thrombosis apart from embolism. As regards embolism, this was only a catastrophe in the course of a fairly common disease—namely, systemic thrombosis. If a proper perspective was to be got, all cases of thrombosis must be tabulated and the number of dislodgements of the clot enumerated. In addition, the investigation must not be confined to surgeons but must be carried out by all branches of the profession, so that all cases of thrombosis and embolism would be put on record.

Professor G. E. Gask (London) stated that the action of the Council in choosing this subject had been justified. It had produced a most valuable discussion of an obscure condition. He gathered that the surgeons were of the opinion that sepsis would not explain all the cases, and the pathologists were of a different opinion. He complimented Professor Glynn, who had introduced a mass of new and original work of the greatest value.

Mr. Lockhart-Mummery, replying, said he had not meant to suggest that sepsis might not be a cause of thrombosis, but that it was not an essential cause. One speaker had argued that in a large number of cases there was evidence of a slight rise in temperature to 99° or 100° previous to the onset of a pulmonary embolism, and had considered that this was evidence of sepsis. Mr. Lockhart-Mummery did not agree, since it was a well known fact that thrombosis itself was almost invariably associated with a slight rise of temperature. Even haematomata caused rise of temperature, and it was not, therefore, safe to argue that in such circumstances a rise of temperature indicated sepsis. Even when definite evidence of sepsis was present it did not necessarily follow that thrombosis was due to the sepsis. On the other hand, in quite a considerable number of cases of thrombosis there was no evidence of any kind of sepsis. He would like to congratulate Professor Glynn on his paper, in which he had undoubtedly proved that primary pulmonary thrombosis did occur and was an important factor. This was a valuable contribution to their knowledge of this difficult subject. If surgeons all over the country would make a point of carefully recording all cases of pulmonary embolism, with careful records of the microscopical and macroscopical findings, it would be a great help in elucidating the problem. With regard to treatment, he was pleased to see that there was a general agreement that constrained positions on the operating table and lack of movement after operations were important contributing factors in producing pulmonary embolism.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

FATAL FOOD POISONING DUE TO BACILLUS SUIPESTIFER B.

The following notes of a fatal case of bacterial food poisoning seem worthy of record.

On June 8th, 1924, a man, aged 43, had for breakfast a pork chop and bacon, for dinner some pig's tongue, beef, and potatoes, and for tea some cake and bread-and-butter. The same evening he had a drinking bout, during the course of which he is believed to have eaten some periwinkles, favoured in the Black Country as a reputed preventive of alcoholic intoxication. On June 9th he remained in bed; he did not eat anything, but drank a bottle of beer and some tap water; during the afternoon he complained of slight diarrhoea. On the next day the diarrhoea got steadily worse and he occasionally vomited. By noon on June 11th the patient was seriously ill with slight abdominal pain and constant purging; some abdominal distension was present; the temperature was subnormal, and the pulse rate a little over 90. The motions were yellowish and slimy, but no blood was seen in them. On the following morning he got up and had a wash; he then returned to bed, was very restless all day, and complained of severe tenesmus and constant purging; his mental condition, however, was quite clear. At 9.30 p.m. he was *in extremis*, and at 10.15 he died.

At the necropsy signs of septicaemia were present. The small and large intestines were acutely congested, fatty degeneration was present in the liver, and cloudy swelling in the spleen and kidneys. At the base of the left lung there was a small patch of pneumonia. Samples from the heart blood, gall bladder, spleen, and small and large intestines were sent to the laboratory for investigation, and Dr. Herbert Henry isolated from all the specimens the *Bacillus suipestifer* B.

The *Bacillus suipestifer* (*aertryck*), or the hog cholera bacillus, occurs in the intestines of normal pigs, and may cause meat poisoning. Pork and preparations made from it become infected by contamination with infected pig's excreta. The bacillus may also be found in mutton and beef. Meat from healthy animals which has been in contact with that from diseased animals may become infected. It has been noted that the bacteria or their toxins may be distributed unevenly in the meat eaten, so that one person consuming the meat may be made very ill while others eating it escape infection. The disease varies much in severity; fatal results are uncommon. Children, old people, and debilitated persons are the most vulnerable. In this case the public health officials made careful inquiry, but were unable to obtain any remnants of food for examination as it had all been eaten. No other cases of illness occurred in the house.

West Bromwich. Dudley Gill, M.B., Ch.B., D.P.H.

LYMPHATICOSTOMY IN PERITONITIS.*

Normal physiological processes do not occur in disease, and this fact dominated the experimental work which laid the foundation for the operation of lymphaticostomy. The disease was set up first and the processes actually occurring in the disease studied. The findings were that septic absorption in peritonitis occurs to a lethal degree through the lymphatics to the thoracic duct. This absorption is from the peritoneal cavity and the lumen of the bowel through the lymphatics proper and the lacteals. There is a suction force on the thoracic duct, due to the venous blood passing the opening of the duct, similar to that created by the Sprengel pump, *plus* a negative pressure which may be present—and probably is always present in peritonitis—in the large veins near the heart. This suction increases with the rapidity of the heart beat, and with the dehydration of the blood, which tends to produce a greater negative pressure in the large veins. This would help to explain the beneficial action of large quantities of saline and the giving of morphine by which the blood vessels are kept filled and the heart action slowed.

In lymphaticostomy the ligation cuts off this suction, and when the duct is opened there is a flow of lymph. The duct does not become distended when ligated, and the lymph flow is less than one would expect from observing the flow through the duct before ligating and opening. The duct

* Slightly curtailed for publication.

is transparent, and, according to the character of the fluid, one sees a translucent or a milky white cord when lymph or chyle is flowing, and to the experienced eye it is unmistakable. In peritonitis, however, the fluid may be bloody and the duct may resemble a vein, and must then be distinguished by its position. In the experiments, I noted that the introduction of tap water into the intestine through a duodenal tube produced an immediate rapid increase in the flow of lymph from the opened duct, and that the lymph became less coagulable. While ordinarily the giving of fluids by mouth in peritonitis will increase the absorption, when lymphaticostomy has been done it is safe to give them, thus ensuring a steady flow of lymph and a washing away of the toxins.

I have had the opportunity of performing the operation in only one case since that reported in March, 1923.[1]

The operation was done on April 21st, 1924, on a boy aged 10 years, who was referred to me by Dr. A. I. Willinsky of Toronto. He had opened the abdomen after the boy had been ill four days, and found a ruptured appendix and diffuse peritonitis. He removed the appendix, and drained the abdomen and the ileum close to the caecum. When I saw the boy, a day later, he was clearly going downhill. Gas and oxygen were given and the duct drained. The flow was profuse for forty-eight hours, lessened on the third day, and had ceased by the fifth. The flow of lymph on opening the duct obscured a view of the opening, so that I had to use a piece of silkworm gut, which was passed about an inch down the duct. A rubber tube was then threaded over the silkworm gut down to the duct and wrapped round with a little plain gauze. Mackenzie's silver cannula, which he describes in the British Medical Journal of June 21st, 1924 (p. 1114), might well be used, provided the lymph was not too highly coagulable. The tube and silkworm gut were removed on the second day and the gauze on the third. The boy made a good recovery, and his family physician states that he is now in good health.

Five cases have been recorded in the literature, of which four were successful. All the cases were apparently hopeless. Edwards[2] operated successfully under local anaesthesia in a woman suffering from puerperal peritonitis. Cooke[3] reported the first case of peritonitis secondary to appendicitis which was successful. The case of "ruptured intestine" reported by Mitchell[4] was unsuccessful.

The difficulty of finding the duct in the cadaver is due to the fact that the duct is collapsed and in that condition resembles fibrous tissue. It is more difficult to find in the dog than in man.

The indications for the operation are not yet clear. It is not an easy matter to say when the patient is experiencing a continual septic absorption which is going to prove fatal, and surgeons are not unanimous in accepting the theory that most of the post-operative symptoms considered to be complications are due to that absorption. Septic absorption in peritonitis leads to increasing distension, obstipation, vomiting, and that peculiar combination of subnormal temperature, rapid pulse and respirations, and mental acuteness which renders the patient aware of the impending end.

In secondary peritonitis such as the case which Cooke described, the operation is definitely indicated as an adjunct to dealing with the condition locally. It may be necessary in certain cases to submit the patient to the two procedures simultaneously. In all cases of secondary peritonitis when only the abdominal operation has been done in the first instance, lymphaticostomy is indicated when in the post-operative course the patient shows symptoms of a continuation of the absorption, and it is highly desirable that the operation be not delayed until the measure could not carry any hope of recovery. It is indicated in those cases of primary peritonitis, especially the pneumococcic, in which the diagnosis is clearly established. When the diagnosis is doubtful the abdomen should be opened first in order to verify the condition.

I believe that with good judgement in election and skill in the performance lymphaticostomy will lower the mortality rate in diffuse peritonitis by saving those to whom relief could not otherwise come.

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References.

[1] Costain: *Surg., Gynecol., and Obstet.*, March, 1923, p. 365. [2] Edwards: Ibid., February, 1924, p. 256. [3] Cooke: British Medical Journal, June 14th, 1924, p. 1038. [4] Mitchell: Ibid., July 5th, 1924, p. 36.

Reports of Societies.

UTERINE BACKWARD DISPLACEMENTS.

A meeting of the North of England Obstetrical and Gynaecological Society was held at Liverpool on October 17th, the President, Professor A. Donald (Manchester), in the chair.

The President opened a discussion on the treatment of mobile backward displacements of the uterus. After referring to the significance of backward displacement, he drew attention to the difference of opinion amongst writers on the subject, and gave an account of the beginning of the passive congestion theory. Passing then to the later explanations of various modern writers, he cited the objections to the congestion theory, and emphasized the point that retroversion was not the cause of endometritis or chronic metritis. There was some difficulty in explaining the effects sometimes produced by a pessary. As a result of investigating the symptoms he concluded that complications were generally the only things that mattered in cases of retroversion. The complications were disordered uterine function, increased weight, prolapse, and adhesions. None of these complications were produced by retroversion. In a small proportion of cases an apparently simple retroversion caused local pelvic discomfort, and even a certain unexplained effect on the nervous system. The treatment of retroversion was nearly always the treatment of complications. More than 90 per cent. of all the patients sought relief from symptoms which were common to all cases of endometritis and chronic metritis, and for these curetting was nearly always advisable. A series of cases in which curetting had been the only treatment was recorded. Mechanical treatment included pessaries and fixation or suspension operations. Pessaries seemed to be of use as a temporary measure in cases of sterility and early pregnancy, and very occasionally in uncomplicated retroversion. There were far too many operations for fixing and suspending the uterus: the great majority were unnecessary, and many of them were harmful.

Professor Henry Briggs considered that a student, ignorant of all gynaecology, including its nomenclature, would naturally classify the backwardly displaced uterus within the pouch of Douglas as a hernia, and would aim at strengthening the deep portion of the pelvic floor and rectifying the position of the uterus. The earlier the effort the better the prospect of the radical cure of a hernia. There were still gaps in the foreground of the picture of obstetrical progress. It was, for example, more than singular to have to acknowledge that the best use of a 3-in. or 3¼-in. ring pessary in the treatment of the retroflexed gravid uterus was advocated twenty-four years ago by the late Sir William Sinclair (*Trans. Obstet. Soc.*, 1900); even to-day this advance was not to be found in obstetrical textbooks. Professor Briggs had not the least doubt that the pessary and frequent urinary catheterism in their gentle and persistent effect totally outclassed manual reposition.

Dr. G. W. FitzGerald (Manchester) agreed that all retrodisplaced uteri did not require treatment, and that symptoms accompanying the displacement were not necessarily due to it. The important matter was to determine which treatment would give the best results. If the curette could show results equal to those of abdominal section, then the minor treatment was to be preferred. He curetted all cases in which symptoms were present, and only rarely found more radical treatment necessary.

Dr. J. E. Gemmell (Liverpool) agreed with Professor Donald that simple retroversion in single women was symptomless in the majority of cases. In parous women, however, he thought that this displacement was in itself capable of producing a definite train of symptoms. He believed that there was a world of difference between an organ that had developed in a particular position of version and one that acquired such a position: the one was in its proper physiological place, the other had acquired a pathological displacement. The vessels of the former had been congenitally adapted to meet the requirements of the retroverted uterus, and could do so smoothly and without

embarrassment to the circulation, whilst in cases of acquired retroversion the vessels shared in the displacement, and were thereby exposed to abnormal pressures that chiefly fell on the veins, and led consequently to back-pressure and congestion. The resulting symptoms simulated those of endometritis and metritis, but he believed they were essentially due to congestion, the result of acquired displacement. He was therefore a supporter of the mechanical theory, and considered there were three clinical types which demanded correction and fixation: (1) A limited number of congenital cases in which the patient complained of sterility, repeated abortions, dysmenorrhoea, or dyspareunia; the type with neurosis and backache was expressly excluded. (2) Obstetric types with the following cardinal signs—a bulky, tender, oedematous and often incarcerated (but not fixed) uterus, associated with pain, menorrhagia, leucorrhoea, or dyspareunia. (3) Cases of simple retroversion accompanied by early prolapse in young women of childbearing age. This third group was not included in the tables given later. Although pessaries and general therapeutic measures were useful adjuncts, and might even be curative in mild cases, he limited himself to the surgical treatment of this condition, and based his remarks upon 125 cases of simple retroversion published by himself in collaboration with Mr. Leyland Robinson.[1] The principles of ventrifixation were not generally understood, and he believed that this procedure had acquired an unpopular reputation because most gynaecologists had studied the wrong type of operation. The type he favoured was planned to fulfil the three essentials upon which the success of all gynaecological operations depended—namely: (1) freedom from immediate risks, such as intestinal obstruction; (2) freedom from the risk of interfering adversely with subsequent conception and parturition; (3) ability to relieve symptoms. The proof that ventrifixation met these requirements was furnished by the following facts.

1. In upwards of seven hundred ventrifixation operations performed by him, only one patient had died from sepsis, and this one in circumstances that had nothing to do with the operative procedure. The patient became unmanageable, removed her dressings, and escaped from the ward to the lavatory on the day after the operation. There were no cases of post-operative strangulation of gut.

2. In 220 cases in which a complete after-history was obtained, 63 women subsequently became pregnant, and were safely delivered of 104 children without a single case of dystocia or stillbirth occurring.

3. The effect of ventrifixation on symptoms (85.6 per cent. cures).

Successful operative technique depended upon three chief factors: the choice of a suitable fixation point, the prevention of adventitious intraperitoneal bands and holes through which the gut might strangulate, and the achievement of a fibromuscular fixation and not of a peritoneal suspension. Operations which fixed the fundus, or anchored the upper part of the uterine body, were naturally prone to accidents which demonstrated the danger of such methods. These accidents had also been widely advertised to discredit the principle of ventrifixation. The level of the utero-vesical fold was unaffected by the changes of pregnancy, and remained passive during labour; it might therefore be described as a normally fixed point. There could be no serious anatomical or physiological objection to fixing a point that was already stationary, and he therefore selected this area as his fixation point, attaching it by means of two silkworm gut sutures to the rectus fascia immediately above the symphysis pubis. The prevention of adventitious bands was brought about by the construction of a bladder septum; the peritoneum covering the bladder was picked up by a series of Spencer Wells forceps from the utero-vesical reflection above to the parietal peritoneum below at the lower angle of the incision. A fold was thus made across the middle of the utero-vesical pouch, through which a continuous catgut stitch was passed, tied, and, lastly, attached to the fascia just above the symphysis pubis. This septum obliterated the supravesical space that would otherwise persist below the fixation area; it formed with the new supporting ligament one continuous wedge-shaped structure that effectually eliminated the possibility of loose bands or peritoneal holes. It should be noted that the septum was formed of peritoneum only, and played no part in supporting the uterus. The efficiency and permanence of both the septum and the new fibromuscular ligament had been repeatedly seen at long intervals after the original operation, when such patients had returned with other lesions requiring abdominal section. He believed, in short, that retroversion was a mechanical defect that was competent to produce symptoms, and he was convinced of the utility of the operation of ventrifixation.

[1] *Lancet*, June 18th, 1921.

Mr. W. GOUGH (Leeds) agreed that many patients with retrodisplacements had no symptoms. If the patient was made aware of the retrodisplacement, a vicious cycle might be set up. Briefly, his practice was, if no symptoms were present, to leave the patient alone; if symptoms were present he curetted the uterus and replaced it. If the displacement recurred, the uterus was replaced and a Hodge pessary inserted for two to three months. If the patient was thereby relieved, nothing further was done, but if her symptoms returned he then operated. He had tried all types of operation except absolute fixation, and found them all equally successful.

Mr. ROBERT A. HENDRY (Liverpool) read conclusions abstracted from the opening report on the "Indications for surgical intervention in retrodeviations of the uterus apart from pregnancy," presented to the Congress of the Association of French-speaking Gynaecologists and Obstetricians, Geneva, 1923. These were to the effect that surgical intervention in uterine deviations, apart from pregnancy, was indicated as follows:

1. In retrodeviations accompanying uterine, ovarian, or par-ovarian tumours in so far as these tumours did not necessitate the sacrifice of the uterus; the pexy was a complementary operation.

2. In fixed and painful retrodeviations.

3. In fixed retrodeviations accompanied by appendage lesions, unilateral or bilateral, which had resisted medical treatment. If the appendage lesions required ablation, it might be necessary to practise total or subtotal hysterectomy; if such was not the case the uterine pexy was only a complementary operation.

4. In painful mobile retrodeviations surgical intervention was only indicated if, when the uterus was replaced, the painful phenomena disappeared. In other cases the pains arose: (*a*) from hysterical state, etc.; (*b*) from multiple visceral ptoses.

5. In certain rare cases of obstinate sterility where no other apparent cause could be discovered.

6. In retrodeviations accompanied by repeated abortion where searching examination eliminated the possibility of syphilis.

7. In all cases where, in addition to the retrodeviations, there was a tendency, even if slight, to prolapse with or without perineal lesions. If the perineum was damaged the pexy ought to be preceded by careful vagino-perineal repair.

8. Painless mobile retrodeviations did not require any treatment.

The discussion was adjourned until the next meeting, which will be held at Sheffield on November 21st.

Prior to this discussion Professor BLAIR BELL (Liverpool) described a case of manual perforation of the puerperal uterus. Abdominal pain followed a normal confinement; on the third day of the puerperium the temperature rose to 103° F.; intrauterine douches were employed. Fourteen days after the confinement the uterus was explored and a large quantity of tissue—subsequently found to be uterine muscle—was removed manually. Suddenly the operator found his fingers pass through the uterine wall. Three hours later panhysterectomy was performed, with removal of a left-sided, twisted, ovarian cyst, which was in front of, and was mistaken for, the fundus of the uterus. The patient made an excellent recovery.

Professor HENRY BRIGGS (Liverpool) remarked on the escape from gross infection during and after the labour. The occurrence of embarrassment arising from lack of acquaintance with the interior of the full-term uterus after a complete labour pointed to the necessity for more practical work in museums and classrooms.

Dr. J. H. WILLETT (Liverpool) commented on the difficulty of removing the placenta in certain cases, and referred to a specimen in the University obstetrical museum, in which the placenta could not even be separated in the laboratory after the uterus had been removed.

Professor A. DONALD (Liverpool) emphasized the facility with which the uterus could be perforated during the puerperium, especially if infected.

Professor BLAIR BELL also described a case of thrombophlebitis of the right ovarian vein associated with abscesses in the uterine wall. The confinement was normal. Nine

days later the temperature rose, the uterus was curetted and washed out with iodine, and a rigor followed. The temperature subsequently ranged between 103° F. and 105° F. The patient was removed to hospital a fortnight after the delivery. *Streptococcus longus* was recovered from the uterus, which was washed out three-hourly with 1 in 20 hypochlorite solution without any definite improvement. A fortnight later panhysterectomy with removal of both appendages and thrombosed ovarian veins was performed. A portion of the ovary was used as a graft. The temperature subsided, and the patient made a good recovery.

Professor HENRY BRIGGS deduced that the bacterial infection in this case was of a mild character and that the lymphatic inflammation was localized.

Mrs. DOBBIN CRAWFORD (Liverpool) reported a case of primary carcinoma of the vagina in a patient, aged 68, who complained of backache and dysuria; on one occasion, three weeks before, a blood stain was found on the sheet. Her previous health was good; her husband had died two years previously of gastric cancer. In the upper part of the vaginal wall, in front and to the left, were several flat bluish-purple bosses, fixed to the underlying tissues but not ulcerated; the cervix was normal and was not encroached upon by the tumour. Cystoscopy showed a dusky area in the base of the bladder. The growth was curetted and cauterized with zinc chloride. On section the growth proved to be a squamous-celled carcinoma. A vesico-vaginal fistula occurred eventually; the patient survived the operation only four months.

SPONTANEOUS UTERINE RUPTURE.

THE Plymouth Medical Society held a clinical meeting on October 21st, with the President (Mr. C. LL. LANDER) in the chair.

Mr. JAMES RIDDEL showed a specimen of spontaneous rupture of the uterus during pregnancy at about seven months. The predisposing causes were described as (*a*) curettage and douching of the uterus; (*b*) manual removal of the placenta; (*c*) syphilis; and the exciting cause as sexual intercourse and indirect traumatism. The site of the rupture was on the anterior wall near the fundus; it was transversely placed over the placental site and was one inch in length. The diagnosis made was ruptured extrauterine pregnancy with internal haemorrhage; the treatment included laparotomy and subtotal hysterectomy. The patient recovered. Dr. ERIC WORDLEY said that the uterus in this case was devoid of muscular tissue at the fundus. Sections of muscular tissue from other parts of the uterus showed hyaline degeneration, cloudy swelling, thickened and thrombosed vessels, and diffuse fibrosis throughout. The degeneration was of long standing. No spirochaetes were seen.

Dr. TWINING showed a man, aged 79, with symmetrical tumours on the inner sides of both thighs which were believed to be fibromata, or, in view of the rapidity of growth—nine months—fibrosarcomata. Operative treatment was deemed inadvisable for reasons of age. Mr. H. G. PINKER showed a specimen of carcinoma of the splenic flexure of the colon which had produced a chronic intussusception in a man aged 53. After removal of the growth and intussusception the transverse colon was anastomosed to the pelvic portion, and the patient made a good recovery.

Dr. THOMAS showed a specimen of sarcoma of the kidney removed from a child aged 4½. The growth was extremely rapid; only a small portion of healthy kidney substance remained. Mr. HAMILTON WHITEFORD showed a breast removed on account of carcinoma, and emphasized the importance of (1) radiography of the thorax to exclude secondary deposits in the lungs, (2) incision into the growth itself before carrying out a radical operation. He exhibited the radiogram of the chest in his case, in which there were shadows of doubtful significance; he had considered it advisable in all the circumstances to carry out a radical operation.

Reviews.

BLACKWATER FEVER IN SOUTHERN RHODESIA.

THE London School of Hygiene and Tropical Medicine has just published a record and report of investigations carried out by the Director of its Protozoological Department, Dr. J. Gordon Thomson, into blackwater fever during 1922 and 1923 in Southern Rhodesia, where he went in charge of a Research Commission to study the subject.[1] Funds for the undertaking were supplied by the Rhodesian Government, the disease being one of serious moment in that territory. The publication sets out how much has been achieved, and, as in other cases, so now again it is shown that money devoted to the cause of public health is not lost, but is, on the contrary, a lucrative investment. The Rhodesian authorities will be able to realize that their money was wisely entrusted, and to congratulate themselves on their public spirit, since this work in their country will be of benefit to all tropical countries where malaria and blackwater fever are found. Those who were present at the meeting of the Tropical Section of the Royal Society of Medicine when Dr. Thomson discussed the relations between malaria and blackwater fever will welcome this fuller account of what was put before them briefly on that occasion.

After a short introductory chapter Dr. THOMSON describes the topography of Southern Rhodesia and the geographical distribution of blackwater fever throughout the world, giving a concise history of the disease. Next follows an interesting summary of its relationship with malaria, a subject further developed in the succeeding chapter, when the association of the malignant tertian parasite with blackwater fever is discussed. The author shows that the older asexual forms, by bringing about the malignant stippling, or Maurer's dots, lead to the production of the "brassy corpuscles"; these, he believes, then become, as it were, foreign bodies, which provoke the formation of a specific haemolytic amboceptor. This haemolysin in the presence of complement acts on corpuscles so altered, but not on normal corpuscles, nor on those harbouring young parasites. Consequently, these last persist throughout the paroxysm, and the fact that they may be very few in number accounts for the discrepant statements of different authors, some maintaining that malarial parasites persist throughout the attack, others denying their presence. The hypothetical *Spirochaeta* or *Leptospira haemoglobinuriae* disappears, for "pseudo-spirochaetes" indistinguishable from those described have been obtained by the author in blood from normal individuals, and he has shown that they originate from blood platelets and damaged corpuscles. Moreover, inoculation experiments with them gave negative results invariably.

Haemolysis in general is discussed, and the various agents which may bring it about. It is shown also that the mode of its production in blackwater fever differs essentially from that in other conditions. The chapter on pathology is comprehensive and deals with the blood plasma, the red corpuscles, the leucocytes, various tissues, and organs. Special sections are devoted to jaundice and its mode of production in this disease, and also to the urinary changes. The clinical aspect is treated very briefly, within three pages, but since this subject receives such detailed consideration in textbooks, anything more would be mere repetition. The chapter on treatment and prophylaxis is most instructive; the questions of the employment of quinine and of the method of its administration when used are ably discussed, and cases are described showing that in some patients an attack of blackwater is precipitated by this drug. It is shown, however, that quinine in the blood stream probably plays no direct part in the haemolysis of blackwater fever, but that its action must be indirect and in association with some other factor. Other forms of treatment, such as Sternberg's mixture, Hayem's serum,

[1] *Researches on Blackwater Fever in Southern Rhodesia.* By John Gordon Thomson, M.A., M.B., Ch.B. London School of Tropical Medicine. Research Memoir Series. Vol VI. London: The School of Tropical Medicine. 1924. (7×9¾, pp. vii+149; 10 plates, 12 charts. 4s.)

Calmette's antivenine, and auto-haemotherapy, also receive mention.

The publication contains some good reproductions of photographs showing "blackwater fever houses"; there are also two excellent coloured plates depicting various forms of corpuscles and the parasites, in which the close resemblance to Babesia is clearly brought out. The photomicrographs of tissue sections are on the whole good, but such a process does not lend itself to the satisfactory reproduction of the prussian blue reaction, for example. There is an exceptionally good bibliography, but no index.

One of the charms of the work is that the author states fairly the findings and pronouncements of others, and, while defining clearly the results of his own work, he makes no claim to have solved this great problem. Since he mentions the views of others, a somewhat more detailed discussion of them would have been welcome, but perhaps that would hardly come within the scope of the present record. The impression derived from this report is that the foundation has now been laid for a solid structure of knowledge. Much has been accomplished, but much more remains to be done.

PHYSIOLOGY IN THERAPEUTICS.

Since its first appearance in 1908 Dr. W. Langdon Brown's *Physiological Principles in Treatment* has established its position as a readable and practical exposition of the current views of physiology and pathology and their application to practice. The fifth edition[2] contains nearly a hundred pages more than its predecessor in 1919 (reviewed in our columns early in 1920) as the result of the addition of new chapters on the work of the liver and on the problems of asthma, and fresh sections on fractional test meals, insulin, uraemia, and dyspnoea. Dr. Langdon Brown points out that the earlier and simpler tests for hepatic function failed because the reserve power of the organ was not realized, so that the tests were positive only when the destruction of the liver was so advanced as to render cure impossible, and, further, that its various functions are not equally affected by disease and so individual tests are necessary. The laevulose test, however, as estimated by the blood sugar, is regarded as one of the best methods of estimating hepatic efficiency. The section on jaundice is largely based on the recent work of Dr. J. W. McNee, and in it the van den Bergh test is clearly explained. In dealing with asthma Dr. A. F. Hurst's definition is accepted, and without adopting Eppinger and Hess's theories in their entirety, the asthmatic patient is regarded as a vagotonic and liable to other manifestations of vagotonia. In both these new chapters the general plan of lucidly correlating the lines of treatment with the most recent knowledge is followed. With regard to Voronoff's grafting operations, Dr. Langdon Brown, who has seen some promising results, preserves an open mind. The rapidly changing history of the treatment of diabetes in recent years is briefly sketched, and this outline gains in interest because the author has had ample opportunity of watching his colleague Dr. George Graham's scheme of the "ladder diet." This diet is compared with Allen's, and the view is expressed that it is perhaps less rapid in removing glycosuria, but less likely to injure the general health of the patient. The uses and indications for insulin are carefully indicated. While not overladen with references, the work of others is freely mentioned. This edition fully maintains the well established claim to popularity of a pleasantly written and useful work.

CYTOLOGY.

General Cytology,[3] described as a textbook of cellular structure and function for students of biology and medicine, is a collection of monographs on the fundamental structure and functions of the cell. It has been written by research workers connected with the Marine Biological Laboratory at Wood Hole, Massachusetts, and no less than thirteen authors, all of them being recognized authorities in their respective fields, have contributed chapters.

They have produced an imposing volume of 754 pages with hundreds of illustrations, and with bibliographies containing thousands of references. The functions and structures of the cell have been studied from every angle, and the result is a comprehensive and authoritative summary of present knowledge concerning the laws governing the ultimate units of living protoplasm.

The most original and striking contribution is that by Professor A. P. Matthews, who has had the courage to tackle anew, in an essay of eighty pages, the age-old problem of the nature of life. With the aid of relativity, the quantum theory, and the recent advances in our conception of the ultimate structure of atoms and molecules, he finally arrives at the following conclusion:

> "The great difference between the living and dead is a difference in the energy content of the molecules and atoms in the two states. All substances, electrons, atoms, and molecules, can and do exist in two forms: energy-rich and energy-poor form. I have proposed to call the former the anakinetomere, and the latter the katakinetomere. The former is the living; the latter is the dead form. The creation of life is the creation of the anakinetomeric form."

This seems to be little more than a restatement of the problem with the introduction of two new terms, and does not help very much. The other monographs proceed along more usual lines of thought, and deal with more concrete and prosaic problems. Professor M. H. Jacobs gives a brilliant summary of knowledge regarding the permeability of the cell; his article is of particular value as it incorporates a large amount of recent American work which is of fundamental importance for the consideration of this difficult problem. Dr. R. S. Lillie deals with the reactivity of the cell and discusses the general nature of the response of protoplasm. The consideration of the problem involves discussion of the nature of the electrical and chemical changes occurring as a response to stimulation and the manner in which the response is modified by changes in temperature, by anaesthetics and other agencies. The author also gives a summary of his own interesting views as to the nature of protoplasmic transmission. He considers that the process consists of a wave of surface change passing along the cells, and indicates interesting analogies between the transmission of excitation in protoplasm and the waves of surface change that occur when iron made passive by treatment with strong nitric acid is dipped into weak acid.

The article on fertilization, by F. R. Lillie and E. E. Just, gives an account of the physiology of the process, and describes the various chemical treatments by which fertilization can be induced or inhibited: a subject with which American workers are particularly associated.

The majority of the remaining articles are devoted chiefly to the microscopic structure of cells, and this is dealt with from various aspects. The book concludes with two chapters on the chromosome theory of Mendelian inheritance, and an account is given of the experimental work done chiefly on the fly drosophila, which has led not merely to assigning specific characters to each chromosome, but even to the production of schemes showing the exact way in which the genetic characters are arranged or packed in each chromosome—an achievement which impresses the imagination as much as the physicists' efforts in tracing the movements and habits of individual atoms.

This summary shows how wide is the range covered by the articles in a book which should appeal to a large circle of readers, cytologists, physiologists, and pathologists. Each will find that the article on the subject he knows best is a comprehensive and considered summary of the latest knowledge, and that the articles on less familiar subjects are clearly written and easy to follow. The book thus gives the reader the opportunity not only of acquiring recent information and useful references in those branches of cytology with which he is best acquainted, but also of obtaining a readable summary of the state of modern knowledge in less familiar fields.

[2] *Physiological Principles in Treatment.* By W. Langdon Brown, M.A., M.D.Cantab., F.R.C.P. Fifth edition. London: Baillière, Tindall and Cox. 1924. (Cr. 8vo, pp. vii + 511. 10s. 6d. net.)

[3] *General Cytology.* A Textbook of Cellular Structure and Function for Students of Biology and Medicine. Edited by E. V. Cowdry. Chicago, Illinois: University of Chicago Press. 1924. (Roy. 8vo, pp. vii + 754; illustrated. 7.50 dollars.)

INDIAN STORIES.

Some forty years ago the late Mr. C. H. Tawney prepared a translation of the Sanskrit *Ocean of Story*, but unfortunately, as the very apt publisher's circular issued with Mr. Penzer's edition[4] explains, it was issued in Bengal and was never reprinted, and hence this wonderful collection of Oriental tales is little known.

In the first instance we owe this collection of stories to Somadeva, a Brahman who lived in the eleventh century A.D. But, albeit they are overlaid with a strong Brahmanic tinge, they are certainly not all Aryan in origin, and it is the opinion of Sir Richard Temple, expressed in his foreword, that they go back to a much older period, having been taken by the editor from the popular Indian folklore of his day. This, as he says, opens up a series of problems for discussion, the first being whence this non-Aryan element came?

> "The Aryan invasions of India were spread over a long period and the progress about the country was very slow. The Aryans came across at least one race, the Dravidians, equal to themselves in mental capacity . . . . The consequent development was on the recognized lines of evolution . . . it was fundamentally Aryan, with accretions from every race with which the Aryans had come in close contact."

This is the problem on which Mr. Penzer's voluminous notes and discussions are intended to throw light. He has had nothing to do with the translation, which is practically Mr. Tawney's original text, supplemented in a few details by Dr. L. D. Barnett; his has been the labour obviously of love, to try to trace the migrations and origin of these stories with their wealth of folklore containing so many finger-posts to their connexions with the past. We are a long way yet from the earliest *jongleurs* of history, but a book such as this is a fresh foothold across the difficult morass of antiquity.

Probably the most important note in the book is Mr. Penzer's discussion of sacred prostitution—a most difficult problem. In the *Ocean* a lady named Rupinika is a courtesan who at the time of worship went into the temple to perform her duty, and it is to this quotation that the consideration of the question is appended. Briefly, Mr. Penzer's opinion is that it is difficult to say to what extent the custom existed in ancient India, although it seems clear that from the Buddhist age onwards the prostitute was held in some esteem; in fact "in Vedic times reliable evidence is insufficient to enable us to form any definite conclusion as to the possibility of distinct connexion between religion and prostitution"; even as late as the early Christian era "we still find no direct reference to the *dēva-dāsī*" (handmaid of the gods). About the twelfth century, however, the evidence becomes more definite and geographical, and it appears that the further south in India the inquiry is pushed the more is the custom found to be recognized. Mr. Penzer then correctly makes full comparison with the ancient Babylonian customs similar to this; there is no doubt that at Erech, the seat of the worship of the mother-goddess Ishtar, religious prostitution was definitely recognized, and had been so from time immemorial. Other nations in the Near East maintained the custom too: indeed, Mr. Penzer goes further afield into West Africa for his material. It is one of those lines of comparison which throw light equally on the old temple rituals and the migrations not only of people but of traditions.

We have no space to go into the other discussions—the cakes baked in queer shapes, the magical shoes which, like the seven-leagued boots, transport the wearer out of danger, the legend of the bitch and the pepper. We could suggest another parallel (that of the Babylonian Etana borne up by the eagle) which might have been included in the note on the mythical Garuda bird. But the reader will have seen from what has here been said that great interest attaches to this book, and, if he have any leanings towards Eastern folklore, we can heartily recommend it to him. The translation of such a wealth of stories offers to Orientalists, particularly those who are not Sanskrit scholars, a mine of queer parallels to the legends in their several spheres, and Mr. Penzer's illuminating notes are full of pregnant suggestion. A most admirable index completes the first volume.

R. Campbell Thompson.

[4] *The Ocean of Story*. Being C. H. Tawney's translation of Somadeva's Kathā Sarit Sāgara. Now edited, with introduction, fresh explanatory notes, and terminal essay, by N. M. Penzer, M.A., F.R.G.S., F.G.S. With a foreword by Sir Richard Carnac Temple. In ten volumes. Vol. I. London: Privately printed for subscription only by C. J. Sawyer, Ltd. 1924. (Super roy. 8vo, pp. xii + 335. £2 2s. per volume.)

GUY'S HOSPITAL REPORTS.

Of the nine papers in the third quarterly instalment of this year's volume of the *Guy's Hospital Reports*,[5] the first three deal with the biliary tract and three others with the stomach. In their investigation of the duodenal contents and bile in man, Drs. J. F. Venables and F. A. Knott of the New Lodge Clinic review 100 consecutive examinations of the duodenal and gall bladder contents; in no instance was it possible to recognize the three types of bile—from the common bile duct, the gall bladder, and the liver—described by Lyon of Philadelphia, and, contrary to Rosenow, the infecting organism in cholecystitis was almost invariably *B. coli* and never streptococci. From a careful microscopical examination of ten recently removed gall bladders Drs. Knott and Bowell discuss the formation of gall stones, and conclude that neither the infective theory put forward by Naunyn nor Aschoff and Bacmeister's biochemical hypothesis will alone prove to be satisfactory, but that both factors must at one time or another act in a complementary manner. They describe as the initial stage of a gall stone an intramural deposit of cholesterin in conjunction with damaged or necrotic epithelium. Mr. W. E. Tanner's analysis of 117 operation cases of cholelithiasis shows that removal is preferable to drainage of the gall bladder. In a successfully illustrated paper on the diagnosis of gastric and duodenal ulcers by *x* rays, Drs. A. F. Hurst and P. J. Briggs describe both the indirect evidence, to which comparatively little has been added since 1914, and the direct evidence—namely, the deformity produced by the ulcer in the outline of the stomach or duodenum—which has become much more available as the result of the improved technique during the last five years. In fact, every chronic peptic ulcer, however small, can now be recognized by the direct evidence, though a small congenital diverticulum close to the cardia may closely resemble the "crater" of a large gastric ulcer. Dr. J. M. H. Campbell contributes two interesting papers—the first with Mr. M. Baird and Mr. J. R. Hern, the second with Dr. J. J. Conybeare—on the correlation of physical fitness and physique with gastric conditions, so as to throw light on the existence of an underlying diathesis favouring the occurrence of peptic ulcer. The examinations conducted on healthy students at Guy's Hospital confirmed the view that certain anatomical and physiological variations present in health may be the physical basis of the subject's diathesis to develop gastric disorders under appropriate conditions. In describing the insulin treatment of diabetes, Dr. W. W. Payne, working under Dr. E. P. Poulton, records a large number of observations, including some to test the effect of combining parathyroid treatment with insulin; some of the few cases thus tested showed evidence that the parathyroid therapy might diminish the blood sugar. Drs. R. D. Passy and J. Carter Braine find that in the anaemias of sprue and of *Dibothriocephalus latus* infection the red blood corpuscles show the same increase in size and in the distribution curves as in Addison's anaemia. Mr. G. F. Gibberd's note on two cases of neurofibroma of the cervical sympathetic is the last in this interesting instalment.

[5] *Guy's Hospital Reports*, vol. lxxiv (vol. iv, fourth series), No. 3, July, 1924. Edited by Arthur F. Hurst, M.D. London: Wakley and Son (1912), Ltd. 1924. (Med. 8vo, pp. 245-368; 63 figures. Subscription £2 2s. for volume of four parts; single numbers 12s. 6d. each.)

NOTES ON BOOKS.

The new edition of the small handbook on the diagnosis of internal diseases[6] by the late Dr. Georg Kühnemann, who died shortly after completion of the manuscript in November, 1922, has appeared within three years of the last edition (see JOURNAL, November 5th, 1921, p. 751). The work has undergone general revision and has been well brought up to date, special attention having been paid to roentgenoscopy.

[6] *Differential-diagnostik der inneren Krankheiten*. Von Dr. G. Kühnemann. Eighth and ninth edition. Leipzig: J. A. Barth. 1924. (Med. 8vo, pp. viii + 253.)

The *Collana Medica "Murri"* is a series of eight medical booklets which have been published by L. Cappelli of Bologna apparently with the object of popularizing the treatment of the more common complaints, such as neurasthenia and nerve troubles, syphilis, constipation, defects of vision, infantile diseases, insomnia, and tuberculosis. The volumes on infantile diseases, insomnia, and tuberculosis[7] have been the last to appear. They give a clear description of the causes of the complaints with which they deal and their treatment. They are evidently intended to enable the patient, or those on whom in home life he is dependent, to help in the treatment by individual effort and by an appreciation of the causes and rational treatment of the complaints, and not for the purpose of eliminating the medical attendant. The booklet on insomnia, for example, concludes with a sentence to the effect that, after all, and especially in insomnia of nervous origin, the wise course is to consult a physician in whom one has confidence, to whom one may unburden one's mind, and from whom one will get good advice. This is the kind of advice popular books on medical subjects should give the reader.

Dr. W. STEKEL of Vienna seems to be one of the most voluminous of living writers. It would appear that a number of his books are to be translated into English, and the first of these has been issued under the title *Conditions of Nervous Anxiety*.[8] Dr. Stekel considers that in the progress in chemistry, physics, bacteriology, and pathology we have neglected the psychic components of disease, and his book is intended to serve as an introduction to psychotherapy for practitioners. He claims the credit of having built up the real psychology of neurotic anxiety by the amplification of Freud's teaching and by modification of some of his errors. Formerly he thought, with Freud, that all anxiety was of sexual origin, but during the war he became convinced that the instinct of self-preservation can produce anxiety without any sexual constituent, owing to the conflict arising between the instinct of self-preservation and the sense of duty. The greater part of the book, however, is taken up with the detailed description of cases illustrating the occurrence of anxiety conditions as the result of repression and violation of the sex instinct. There are chapters also on anxiety neurosis in children and the technique of psychotherapy. The translator, on the whole, has done her work well, although her lack of familiarity with medical terminology is a drawback.

The cult of beauty in woman (and man) is ancient, it is modern, and is not likely to diminish in the future. The standard of human beauty has varied and varies to-day, but it has never failed to attract and be desired, and there have been many attempts to cultivate it. M. MASQUILIER[9] in his book bursts into rhapsody on the practice of "morphotherapy," or the education of the beauty of the human body. He conceives of beauty of form, of movement, and of expression, and tells how they have been sought after in systems old and new. For him the modern town dweller waxes old before he is young; he is like a slow-combustion stove that has become clogged and needs the forced draught of physical cultivation. All women—he must mean all who don't work or take to sports—are atrophic, hiding wasted muscles under an adipose coating. Yet even he can see some improvement since they have discarded the corset and freed the neck, bosom, and lower limbs from the thraldom of clothes. The cult that he urges is summed up in the word "re-education"—the discovery of the undeveloped or wasted function and the recovery of it. Movements—active and passive, free and controlled—massage, the reform of dietary and of the mode of life, all are made servants to the idea of re-education, and in that there is beauty for all. It is an essay not without truth, and not without interest, albeit the adjectives are too often in the superlative.

Drs. IRVING J. SANDS and PHYLLIS BLANCHARD have conjointly written a book on *Abnormal Behaviour*,[10] which serves to demonstrate the change which is taking place in the attitude of the community towards the individual who does not conform to its customs and standards of conduct. Formerly, as the authors point out, the person who showed aberrant behaviour traits was looked upon as a social outcast, whereas now the tendency is to look upon such an individual as mentally ill and to seek for the cause of his abnormal conduct. The book deals largely with concrete cases of the various forms of abnormality; full descriptions are given, the causes discussed, and the mode of dealing with them indicated. The treatment of the subject is elementary, and the book is thoroughly suited to the needs of the social worker.

[7] *Come si cura il bambino*, by G. Finzio (pp. 68). *Come si cura l'insomnia*, by C. F. Zanelli (pp. 73). *Come si cura la tuberculosi*, by P. Ramonia (pp. 87). Bologna: L. Cappelli. 1922. (4 lire each.)

[8] *Conditions of Nervous Anxiety and their Treatment*. By Dr. W. Stekel. Authorized translation by Rosalie Gabler. London: Kegan Paul, Trench and Co., Ltd. 1923. (Demy 8vo, pp. xii+435. 25s. net.)

[9] *L'Education de la Beauté du Corps Humain: Traité pratique de Morphothérapie*. Par M. Masquilier. Paris: Gaston Doin. 1923. (Imp. 16mo, pp. 126. Fr. 10.)

[10] *Abnormal Behaviour: Pitfalls of our Minds*. An Introduction to the Study of Abnormal and Antisocial Behaviour. By Irving J. Sands, M.D., Instructor in Neurology, Columbia University Medical School, and Phyllis Blanchard, Ph.D., formerly Psychologist, Bellevue Hospital. London: George Routledge and Sons, Ltd. 1923. (Demy 8vo, pp. ix + 482; illustrated. 16s. net.)

PREPARATIONS AND APPLIANCES.

"Oxoid" Gland Preparations.

WE have received samples of a series of "Oxoid" gland preparations, recently placed on the market by Messrs. Oxo, Ltd. The following are the chief preparations:

Thyroid gland tablets grs. 5, 2, 1, 1/2.

Pituitary gland:
- Anterior lobe tablets gr. 5.
- Posterior lobe tablets gr. 2.
- Whole gland tablets gr. 5.
- Liquor hypophysis 20 per cent. and 10 per cent. extracts.

Suprarenal body:
- Suprarenal gland tablets gr. 5.
- Adrenaline tablets gr. 1/64 and 1/128.
- Adrenaline solution 1 per 1,000.

The makers claim that the fresh glands are desiccated by methods devised to give the maximum protection to the active principles, that all subsequent chemical processes are conducted with great care, and that the final products are standardized to a uniform strength by modern chemical and biological tests.

Tests made for the BRITISH MEDICAL JOURNAL upon the adrenaline and posterior lobe pituitary preparations showed that these had a high physiological activity.

It is interesting to note that Messrs. Oxo are subjecting their thyroid preparations to pharmacological and therapeutic tests. This is a very satisfactory departure, for it ensures the medical practitioner receiving thyroid preparations of uniform activity. This, of course, is not ensured by the ordinary chemical tests. The prices charged for the preparations are, moreover, very reasonable.

A Packing for Surgical Dressings.

Under the name "Steraids" Messrs. Robert Bailey and Son, of Marriott Street Mills, Stockport, have devised a simple method of packing for surgical dressings. It consists of a double cylinder of cardboard, the inner cylinder containing 3 or 6 yards of plain or medicated absorbent gauze. Each cylinder is slotted for nearly its full length. By rotating a flange at the bottom of the inner cylinder the edge of the gauze appears in the slot of the outer cylinder. When the two slots are opposite one another the amount of gauze required can be drawn out and cut off; the apparatus is closed by turning the flange in the opposite direction. The packing is simple and effective, and prevents the exposure of the dressing to the atmosphere or to handling. It should prove a very useful method of keeping dressings in the surgery and for first-aid purposes.

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee fifty-seven cases were considered and £673 0s. 9d. voted to forty-seven applicants. The following is a summary of some of the new cases relieved:

Widow of M.D.Edin. who died from influenza and pneumonia after two days' illness. Applicant is left with three boys, ages 11, 6, and 3. Her total income is £145. She asks the Fund to help with school fees for the second boy. A small grant was made and the case handed over to the Guild.

Daughter, aged 50, of L.R.C.P. and S.Edin. who died in 1915. She is an artist and was employed by a motor firm which failed, throwing her out of employment. Her rent is 13s. 6d. per week. From January to April she managed to make £1 a week, but since it has only been 10s. Voted £10.

Widow, aged 61, of L.R.C.P.Edin. who died in August last. She received £200 for the goodwill of the practice, but after paying expenses only £15 is left. Her husband's annuity died with him and she has only £26 a year. Voted £5.

Daughter, aged 79, of M.R.C.S.Eng. who died in 1866. Applicant has double cataracts and has fractured her left wrist. Another charity is only able to help temporarily by making her income up to £1 a week. Voted £5.

Daughter, aged 79, of M.R.C.S.Eng. who died in 1871. Through the failure of a boarding house which applicant had taken she lost all, including the furniture. Voted £30 in twelve instalments and a special grant of £5.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, K.B.E., C.B., M.S., at 11, Chandos Street, Cavendish Square, London, W.1.

The Royal Medical Benevolent Fund Guild still receives many applications for clothing, especially for coats and skirts for ladies and girls holding secretarial posts, and suits for working boys. The Guild appeals for second-hand clothes and household articles. The gifts should be sent to the Secretary of the Guild, 58, Great Marlborough Street, W.1.

ROYAL COMMISSION ON LUNACY AND MENTAL DISORDER.

(*Continued from page 820.*)

The sittings of the Royal Commission on Lunacy and Mental Disorder were resumed on November 4th, under the chairmanship of the Right Hon. H. P. Macmillan, K.C.

Evidence of Medical Superintendents of Poor Law Infirmaries.

Dr. A. L. Baly, medical superintendent of Lambeth Infirmary, was the first witness. He said that the accommodation for mental cases in his institution consisted of four wards with 50 beds for women, and one ward with 11 beds for men; he hoped to increase the accommodation on the male side within the next few months. The cases which came under observation ranged through every degree of mental disorder. A magistrate attended two days a week for the purpose of certification. During the year ending March 31st last the number of persons brought before this magistrate was 615; the majority (453) were admitted on the request of the relieving officer or the police under Section 20 of the Lunacy Act, which provided for three days' detention; other cases were transferred to the mental department from the general wards of his own or another institution. Of the 453 cases on three days' detention, 193 were afterwards transferred to mental hospitals, in 111 other cases the orders were allowed to lapse, and the remaining 149 were either eventually discharged or transferred to the general wards. Very many of these cases were technically short of lunacy, and yet it was advantageous to the patient to be for a time under control. The cases transferred to mental hospitals were those amenable to treatment, for which there was no provision in the Poor Law infirmary; cases retained in the infirmary were chronic, and mostly senile. The constant difficulty with which he was faced was not in saying whether a person was of unsound mind, but whether it was proper to place him in a mental hospital; the answer to this second question depended largely on the patient's home conditions. A scheme whereby persons of unsound mind might be placed on trial without certification would remove a great deal of the difficulty. The friends of the patient were almost invariably anxious that he should not be certified, and many of the cases of mental unsoundness which found their way to a Poor Law infirmary were obviously of a temporary nature. Domestic troubles accounted for not a few of them, and he had actually had cases in which husband and wife alternately sent one another to the receiving institution! Unemployment was a fertile cause of mental instability. Cases which proved after observation to be clearly not certifiable were mentioned to the magistrate on his visit and discharged at once, unless the patients happened to be suffering from physical ailments, in which case they were sent to the general wards. In certain cases in which it was not clear that discharge should be given, and which it was desirable to keep under observation for a longer time, he had certified but suspended the certificate, so that the patient was not sent immediately to a mental hospital, and if he recovered neither he nor anyone else was aware of the fact of certification.

The witness was examined at some length on this expedient, and Earl Russell pointed out that although no harm might be done, the person so dealt with could not bring an action for slander against someone who asserted that he had been certified. Asked as to his own position should an aggrieved patient take action, the witness expressed the view that any medical practitioner giving a certificate of any kind ought to be protected in the same way as a witness giving evidence on oath. He had taken legal advice on his own liability, and had received some reassurance. Asked from whom the advice had been taken, he said that it was from a Commissioner of the Board of Control, at which there was some laughter among the members of the public present. The witness added that the apprehension of legal troubles was now very acute among private practitioners, who were showing a disinclination to participate in the administration of lunacy law.

Asked with regard to the position of the relatives of a patient, Dr. Baly said that in every case an effort was made by the relieving officer, and if necessary by the police, to trace the relatives. The chargeability for the patient was the motive in so doing, but as a medical officer he wanted the assistance of the relatives for another reason—namely, that he might learn the history of the case and their wishes with regard to the patient.

Some discussion arose on the cases of patients suffering from delirium or other mental symptoms accompanying fevers, and the witness said that in his experience these cases occasionally came within the operation of lunacy administration. Such cases as uraemia were sometimes transferred, for greater convenience in administration, from the general wards in another institution to the mental wards in his own, and the Lunacy Act had to be invoked to secure the transfer. Only a small percentage of such people were eventually certified, and if an insanity appeared to be due to a physical condition he always did his utmost to retain the patient instead of letting him go to a mental hospital. With regard to alcoholic cases, it appeared to be a matter of chance whether a person whose mental condition was due to alcoholic excess was taken to the police-station or the lunacy ward.

In reply to other questions, Dr. Baly put forward an objection to the hard and fast segregation of mental cases. He thought there were advantages in treating mental cases in a general institution, not only because the stigma was thereby removed, but because the patient had the advantage of supervision and treatment by a general medical staff. He thought that it would be sufficient to have, in addition to the staff of a general hospital, a special mental consultant. The Chairman said that the Commission would certainly desire to diminish the distinction between mental and other illnesses, but the fact could not be overlooked that mental disease had the peculiar feature of disturbing the responsibility of the citizen. Moreover, the stay of a patient in a general hospital was usually short, but mental disease, unhappily, ran a long course, and was often permanent. The symptoms in many cases were also such as to make it undesirable to associate persons suffering from mental disorder with rational patients. The witness replied that this was not necessarily the case. He maintained that a very large class of mental cases could be treated in a general ward; for others a separate ward would be necessary, and for incurable cases there had better be a separate block, if not a separate institution. In reply to Sir Humphry Rolleston, he agreed that it would be an advantage for assistant medical officers in Poor Law institutions to be seconded for a short period to mental hospitals; if Poor Law institutions obtained power to retain curable patients for a longer period than was at present allowed it would certainly be necessary to have on the staff medical officers who were expert in the treatment of mental disorder. A member of the public desired that some questions should be put to the witness with regard to the provision in the medical curriculum for the study of mental cases, but the Chairman said that this information would be forthcoming from a representative of the General Medical Council whom it was intended to call.

Dr. J. Dudgeon Giles, medical superintendent, Salford Union Infirmary, said that he had one male ward with 70 beds for mental cases, and two female wards with a total of 100 beds. Among about 900 patients in his infirmary he had an average of 150 mental cases. About 80 per cent. of these patients were brought to the institution by a relieving officer or the police, and kept on a three days' detention order. A very small proportion of these were discharged within the three days, and the remainder were placed on the fourteen-day order for observation, Section 24 of the Act being invoked to admit of the fourteen-day detention. A certain number were then found to be certifiable and were removed to the mental hospital; others—chronic cases—were placed under a permanent detention order. If one order lapsed without a definite step being taken the patient was discharged altogether to another ward and "tried out" for a day or two, and if the symptoms still remained the matter was taken up *de novo*. He felt strongly that a period of observation and provisional treatment, with some sort of control, should be allowed by law before certification. But it was very necessary to have some power to say to relatives that a particular patient during a certain period must not be taken out of the institution. Provision for treatment without certification would certainly encourage people to come forward voluntarily at an early stage of their malady. He thought that the fourteen days' detention period might usefully be extended to a month. He agreed with the Chairman, as the previous witness had done, that the programme of action as set out in the Lunacy Acts was not at all well defined; the system, interpreted as it had been by intelligent and sympathetic medical officers, had not worked badly, but it was very desirable to have some simplification.

An International Catholic Missionary Exhibition will be opened in Rome on December 25th, and will remain open during next year. The medical section of this exhibition is being organized by several professors, and special attention is being paid to tropical diseases. Educational exhibits are being collected from various countries, including England.

We have received a copy of *Revista dos Cursos*, 1924, Anno x, N. 10, the official organ of the Faculty of Medicine of Porto Alegre, Brazil. The issue contains an introductory address by Professor Fabio Bairos, occupant of the chair of physiology, followed by seventeen clinical lectures on various medical and surgical subjects, which are illustrated by numerous photographs and skiagrams.

British Medical Journal.

SATURDAY, NOVEMBER 8TH, 1924.

PARLIAMENT AND MEDICINE.

TO-DAY we give a brief account (at page 872) of the election fortunes, or misfortunes, of all the members of the medical profession who have been candidates for Parliament, with the single exception of the Scottish Universities constituency, in which the polling has not yet closed. Five who were in the House of Commons recently dissolved have been re-elected, and there are six new members, two of whom, however, had been in a previous Parliament. Four who sat in the last Parliament have been rejected this time, and thirteen others have also been unsuccessful, some of them having formerly been candidates or members; the unsuccessful include three medical women. All parties are represented amongst the defeated, but Labour predominates to the extent of ten of the seventeen. The eleven so far elected consist of six Conservatives, four Labour members, and one Independent, the setback of the Liberals leaving that party without a medical member in the House.

It is important that, apart from political colour, the voice of medicine should be heard in Parliament when questions involving professional knowledge and experience are under discussion, and the group as now elected contains all the necessary qualifications. For the most part they have not been appointed as doctors, but as belonging to one or other of the two main political parties; and, as it happens, the general composition of the new House of Commons is not unfairly reflected in the fact that six are Conservatives, one is Independent, and four are Labour members. On university education, the Health Insurance Acts, the fostering of research and the regulation of animal experiments, the promotion of vaccination, the "welfare" movements in respect of mothers, infants, and school children, the control of tuberculosis, the extension of institutional accommodation as preferable to home treatment for many diseases—on all these and other such questions to have at hand a body of expert knowledge and opinion within Parliament itself is unquestionably a great advantage.

But the medical members would be taking up an entirely false position—indeed, would be destroying their own influence—if they were to assume too much of an *ex cathedra* attitude in the discussion of subjects which admittedly are in their special ambit. It is true that within less than a generation the science of medicine has made marvellous advances in the prevention and the curing of disease. It is true also that the country realizes as never before the tremendous national service which modern medicine can give in fostering the common weal. But that realization enables laymen in Parliament to take a large part in developing a policy for utilizing the newer knowledge. In particular, the financial aspects of every proposal must in these times be most carefully considered. The "anti-waste stunt" has fortunately subsided, but the reckless extravagances and profiteerings which were perhaps largely inevitable in the war have not been forgotten, and render rigid scrutiny of contemplated new outlays all the more obligatory. This does not mean refusal to spend where expenditure can be demonstrated to be profitable, even if the profit be not immediate. Not so long ago advocacy of casting bread upon the waters to have it returned after many days could have met with the rejoinder that before the many days had elapsed death from starvation would have occurred. The country, however, seems now fairly on the way to recovery, and can afford to take a longer view. The national buoyancy already in evidence is itself a sign of reviving communal health, and when projects for subsidizing from public funds schemes making for public health come before the Legislature, boldness and enterprise may be the truest economy. Always, however, this attitude is subject to one reservation. To justify boldness necessary preliminaries are the making sure that a scheme is fundamentally sound, and that there will be no incidental evil reaction on the character of those to whom it is to be applied. There is now very general recognition that the system of doles which has been so largely resorted to during prevalent unemployment tends to be most harmful to the character of many recipients. It fosters both idleness and discontent. The old workhouse practice of setting casual inmates to labour of little or no intrinsic value, such as oakum picking or stone breaking, for which many of them were quite unfitted, was bad; but at least it showed a glimmering appreciation of the evils of absolute idleness. The dole policy does not even do that: it fosters idleness. That being perceived, new methods of house-building, which are to diminish greatly the need for bricklaying and to provide occupation for unskilled labour, are obviously on the right lines, and Parliament should not hesitate to afford them reasonable support. The same principle should hold throughout the whole sphere of public assistance. In questions of health the giving of aid should be accompanied by compulsion towards obedience and discipline. That applies in respect of venereal disease, tuberculosis, rickets, and any other conditions which are coming within the operations of State-aided or rate-aided schemes.

We would press on the consideration of the new Government, as soon as Lord Onslow's Royal Commission has reported, one question of the utmost public importance which has long awaited solution. It is the reorganization of the whole system of local government, including the relationship of the two great departments of Poor Law and Health. Apart from the county boroughs the areas for public health administration in England are as a rule absurdly too small. Each of them is in theory responsible for administering (with certain exceptions) the numerous Acts relating to sanitation, water supply, drainage, scavenging, the healthiness of workshops, the enforcement of building by-laws, the appointment of medical officers of health, sanitary inspectors, and veterinary officers, the supervision of meat and milk and food supply, and the control of tuberculosis, acute infectious diseases, and venereal diseases. By sheer force of circumstances voluntary agreements have been made for combined action in many adjoining areas, while in respect of some matters, especially institutional accommodation, the law has intervened for the creation of wider amalgamations. But hand-to-mouth measures are inadequate and incomplete. Reform on national lines is urgently necessary. The task should definitely be undertaken by the new Government. It has all the qualifications for the purpose—sufficient time to give careful departmental consideration to the whole complicated subject and an ample majority to carry out its ultimate decisions. It may meet with many difficulties, particularly opposition from small local interests and prepossessions. Some existing authorities, however limited their area, and some officers, however

small their salaries, may be expected in such circumstances to offer objection to interference; but in any wise scheme care would be taken to deal tenderly with such difficulties, and a measure of national importance cannot be indefinitely postponed in deference to local sensitiveness.

Britain now indulges in the hope that for at least another lustrum it will have a Government wise enough to develop a sound national policy, and strong enough to persist in it. A health programme must be an essential part of that policy, and its guidance and control will require a strong and broad-minded Minister: a man whose standing and reputation will inspire confidence, who will be allowed by the Prime Minister to remain in the one office long enough to set his mark, not only on the physical health of the community, but also on its character for self-reliance and independence. Mr. Baldwin has many great offices to fill, and he has at his disposal men qualified to do justice to most of them. As years pass some departments of government lose in importance and others gain. To be Minister of Health in England at the present time affords a field of work worthy of the talents and ambition and patriotism of the best man to whom the offer of the post may be made.

A GENERAL VIEW OF LARYNGEAL TUBERCULOSIS.

It is a common reproach of specialism that it tends to detach itself from the general commonwealth of medicine, and, by concentrating its attention on a limited area, to cultivate a small district to the neglect of the interests of the whole body politic. This may be true of the more myopic exponents of a special subject, but there are others with greater range of vision. It is from amongst this number that some of the most valuable additions have been made to the general knowledge of the medical profession and to its capacity to cure. Of those who have thus contributed in the past the names of Hughlings Jackson and Spencer Wells rise to our memory. Modern, if less striking, instances are, we are glad to say, becoming more frequent, and the Mitchell Lecture, delivered before the Royal College of Physicians of London this week, and printed at page 841, is a case in point. The subject of tuberculosis of the larynx was therein dealt with by an expert; but, instead of focusing attention on local lesions and technical points—interesting and valuable to the laryngologist, but not to others—Sir StClair Thomson, out of the wealth of his experience and observation, shows the general physician the urgency of detecting the presence of developing tuberculosis in the larynx.

It is scarcely too much to say that after Sir StClair Thomson's exposition no case of pulmonary tuberculosis presenting a laryngeal complication can henceforward be looked on as "slight," for of all the laryngeal patients he saw during ten years in the King Edward VII Sanatorium at Midhurst (early and "favourable" cases, as things are at present), no less than 70 per cent. were dead within a few years. Between 1911 and 1921 some 2,540 patients with pulmonary tuberculosis were discharged from that institution. Of the patients found to have tuberculosis of the larynx during those ten years, two out of every three were dead by 1922; but of those with a sound larynx two out of three were still alive. Another valuable lesson for the general physician is that progress or the reverse does not necessarily take place *pari passu* in the lungs and in the larynx. It generally does so, but not always. Hence a diseased larynx may become arrested or even heal completely while the lungs deteriorate. But the converse never occurs: that is to say, while the laryngeal disease is advancing no arrest of the mischief in the lungs is possible. This is a very valuable prognostic point which the attendant physician might well bear in mind.

In the words of the lecturer, the 70 per cent. mortality among his 477 throat cases is "an arresting and a saddening thought." But it must be faced. His abandonment of all local surgical measures, together with the entire armamentarium of caustics, paints, insufflations, and sprays, introduces a simpler, gentler, and more effective scheme of therapeutics. He claims that the principal factor in treatment should be the sanatorium régime and a co-ordination of the study of the patient's laryngeal with that of his pulmonary and general condition. As regards local care, good results were obtained from the simple method of local rest, secured by limiting the voice to a whisper, or by enforcing the more heroic rule of strict silence. The only local application employed was that of the galvano-cautery, which was used in 74 cases and yielded 46 cures; the method of "whispers" and "silence" arrested the disease in 73 cases. These 119 arrests among 477 laryngeal cases show a cure in 25 per cent. of cases, the highest proportion hitherto recorded in this country. The conclusion to be drawn from these figures is in striking contrast with Morell Mackenzie's opinion forty-four years ago, "it is not certain that any cases ever recover," and that of another authority of the same period, who said, in reference to patients with tuberculosis of the larynx, "all are doomed to die: the appearance of the disease in the larynx is the warrant of death."

The laryngeal manifestation still remains one of the most serious complications of pulmonary tuberculosis; but Sir StClair Thomson's record of his experience gives encouragement by showing that nowadays one case in four may be arrested. Still better results could be obtained by what we all invoke—early diagnosis. The Mitchell Lecture throws light on this, as on many other points.

THE PROGRESS OF RADIOLOGY.

Twenty-nine years ago Roentgen made his great discovery as the result of physical investigations with a Crookes's tube. Since that time progress has been steady, and the value of x rays in diagnosis and in treatment has steadily increased. Great improvements sprang from the discovery of a hitherto unrecognized property of radiations, and their action upon a fluorescent screen. From this simple beginning a new science has grown up, and its applications to medicine have been many. Diagnostic aid has been given in various branches of medicine and surgery, and radiations have been applied therapeutically to a large number of diseases. For diagnosis and treatment very elaborate technique has been evolved. Mechanical and physical devices have been invented for the estimation of the penetrative value of radiations, and for the establishment of a system of dosage for particular diseases.

The part played in these advances by British radiologists has been noteworthy. Many of the pioneers suffered grievously as a result of their devotion to the advancement of the new science, and several lost their lives. A fitting memorial to those early workers—James Mackenzie Davidson, Cecil Lyster, Ironside

Bruce, Archibald Reid, and others—is now approaching completion. The British Institute of Radiology (an account of which appears on another page) will, when fully equipped, commemorate the work of these men, and hold out to their successors facilities for adding still further to the lustre of British radiology.

It is but seven years since a number of radiologists, physicists, and electrotherapists of this country realized the need for concerted action. To realize was to act, and almost immediately they drew up a complete scheme for the necessary teaching in the twin subjects of radiology and electrology. The University of Cambridge was approached, and with commendable foresight agreed to grant a diploma in the two subjects: courses of lectures and practical work were instituted all over the country, followed soon after by the establishment of a diploma at Liverpool. The original plans included the founding of an institute which would provide a centre for radiologists and become the co-ordinating body for this work throughout the British Empire. In 1923 this question of an institute was revived by the formation of a committee representing the Roentgen Society, the Electro-Therapeutic Section of the Royal Society of Medicine, and the British Association for the Advancement of Radiology and Physiotherapy. The late Sir Archibald Reid was the chairman of the committee at the time of his death, and it was largely due to his acumen that a suitable building, at 32, Welbeck Street, was acquired. Financial support for the venture was given by the trustees of the Mackenzie Davidson Memorial Fund, who handed over this fund for the purchase of the lease of the building and for the housing of the Mackenzie Davidson library. The British Association for the Advancement of Radiology and Physiotherapy by a change of name became the sponsor for the institute. It is hoped in the near future to incorporate in some way the Roentgen Society and other allied societies, so that the interests and activities of kindred bodies may find suitable headquarters in the same building.

Members of the medical profession, physicists, and technicians will be welcomed at the institute, either as full members or associates. It is hoped that the institute may in this way become a common meeting place where members and professional colleagues may discuss matters of mutual interest. Radiology has been regarded by some as a speciality which can and should exist alone, but radiologists insist that its greatest benefits can only come through collaboration with other branches of the profession. In furtherance of this aim it is intended to build up a collection of negatives and lantern slides covering the whole of the diagnostic field. The institute is the last of the objectives originally aimed at by the committee formed in 1917, "to consider the steps to be taken to advance British radiology, and to improve the status of those practising in these subjects."

INJURIES OF THE SPINAL CORD AND CAUDA EQUINA.

THE committee appointed by the Medical Research Council to report upon injuries of the nervous system arising in the war has lately issued its Report No. 2, on injuries of the spinal cord and cauda equina.[1] The committee is to be warmly congratulated on the result of its labours, which forms a very valuable and interesting document. It may, indeed, be hoped that this report will succeed in reaching a wide public in the medical profession, for it is much more than a mere record of the injuries of warfare. The broad lines on which the committee has wisely conceived the report have enabled it to apply the lessons of the war to the injuries and diseases of civil life. The importance of applied anatomy and physiology in diagnosis is steadily kept in view, while the disturbances in function arising from injury or disease are considered in relation to the various structural, functional, or psychical abnormalities encountered. After a brief introduction, in which the secondary importance of injuries to the bones of the spinal column is stressed as compared with the greater importance of damage to the nervous elements, a short but highly practical and informing chapter on the applied anatomy of the spinal cord follows. A discussion on the applied physiology of the spinal cord includes a useful description of the not uncommon cases of unilateral injury of the cord (Brown-Séquard lesions), especially in relation to the alterations of sensation which may be found in those examples of incomplete lesions familiar to neurologists but often unrecognized by others. A careful account of the phenomenon known as "spinal shock" is given; this condition is manifested by a complete flaccid paralysis, with abolition of all reflex activity and all forms of sensation below the level of the lesion, and by retention of urine and faeces. In favourable cases—that is, in the absence of septic infection of the bladder or of bedsores and of gross secondary changes in the parts of the cord below the lesion—the effects of this spinal shock begin to pass off in from seven to ten days. It will therefore be obvious that, until this shock has passed, a very great difficulty will be found in deciding whether any given case is one of complete lesion of the cord or not. Though at first sight perhaps superfluous, the chapter devoted to methods of examination is one of the most valuable in the whole report, for not only are the methods themselves described, but the significance of the various signs elicited is carefully considered. The examination of the changes in the reflexes, in the power of voluntary movements, in sensation, and in the functions of the bladder and rectum, is duly set out, while the added remarks on the characteristic features of hysterical paralysis and other hysterical manifestations should prove most helpful. In the committee's view the value of the tuning-fork in testing the functional integrity of the posterior columns of the cord is definitely established, and it may be hoped that this simple and useful method of examination will be more widely adopted. The actual diagnosis of spinal cord injuries is considered under three heads: (1) the distinction of organic symptoms from those of psychical origin; (2) the occurrence of organic symptoms arising from injury in cases where disease is already present in the spinal cord; and (3) the regional diagnosis or more exact localization of injuries of the spinal cord. It is hardly possible here even to summarize all the conclusions reached on these important issues. But in view of the misleading appearances often produced by different involuntary and reflex movements of the paralysed limbs, as well as by the occasional return of the deep reflexes even in cases of complete transverse lesions of the cord, it is well to record the opinion of the committee that the only trustworthy signs that the cord has not been completely divided are (1) the return of sensation and (2) the return of voluntary power. Much valuable advice on the treatment of injuries of the spinal cord is given, especially in regard to the prevention and treatment of urinary infections, the care of the bowels, and the prevention of bedsores. The indications for laminectomy are considered and the technique of this operation briefly described. The attitude of the committee towards laminectomy will probably be considered as distinctly conservative, but it is undoubtedly right in insisting that no useful purpose is served by operation in the early stages except in the presence of certain definite indications, tabulated as follows: (1) the presence of a gross

[1] Medical Research Council. Report of the Committee upon Injuries of the Nervous System: II, Injuries of the Spinal Cord and Cauda Equina. London: H.M. Stationery Office. 1924. Price 1s. 6d. net.

bony deformity or a missile demonstrated radiographically, with signs that the cord is not irremediably damaged; (2) an arrest in the recovery of conduction through the damaged cord after the effects of spinal shock have presumably passed away; and (3) the presence of severe and persistent root pains. It is interesting to learn that the committee finds that the old teaching—"the lower the injury the better the prognosis"—has not proved true; the records of the war show that the survival period depends more on the severity of the lesion than upon its segmental level in the cord. The report treats the injuries of the cauda equina on the same plan as those of the spinal cord. Thus anatomy and the motor and sensory functions are first briefly described. The severe pains which often complicate these injuries are rightly emphasized, while the disturbances in the functions of the bladder and rectum and their mechanisms are explained in detail. It has been found that the period of retention of urine and faeces is longer than in the cases of injury to the cord itself, but even here in favourable cases automatic micturition and defaecation may be established in from four to eighteen months after the injury. A greater risk of urinary infection and a greater risk to life naturally follows. The clinical picture presented by lesions of the conus medullaris very closely resembles that when the cauda equina is affected, and indeed in some examples it is not possible clearly to differentiate between them; occasionally the presence of some form of dissociation of sensation may favour the diagnosis of a conus as opposed to a cauda equina lesion. While traumatic lesions of the cauda equina are generally easy of diagnosis, it is far otherwise with conditions such as tumours or chronic meningitis of the nerve roots in this region. The various forms of sciatica, true sciatic neuritis, osteo-arthritis of the lumbar vertebrae, for example, are all states where accurate diagnosis may for some time be very difficult. The methods of examination and the interpretation of symptoms detailed in the report will be found of as much value in civil practice as they have been in the injuries of war. The anterior nerve roots of the cauda equina possess a definite power of recovery which is not shared by the posterior roots; the nearer, however, the lesion is to the spinal cord the less is the prospect of regeneration. A number of cases are now on record in which foreign bodies, bullets, or pieces of metal have remained embedded amongst the nerve roots for considerable periods of time, and have apparently been responsible for symptoms of a chronic neuritis which have largely disappeared after their removal. Towards operations on the cauda equina a conservative attitude is again recommended. It is very rarely possible at operation to identify or suture any individual nerve roots, though foreign bodies can be removed and adhesions divided. The report concludes with a brief description of the various orthopaedic measures which may be used in the correction of the residual palsies following lesions of the cauda equina.

PATENT MEDICINES.

An excellent article by Sir Thomas Horder on "The scandal of secret remedies" appears in the current number of *The World Today*. The author does not devote much space to proving the obvious—namely, the worthlessness of the quack nostrums that fill the advertisement columns of so many newspapers and other periodicals—but he discusses the means of remedying the scandal. The law to-day is the same as it was when summarized by the Select Committee on Patent Medicines in 1914 in the following statement: "For all practical purposes British law is powerless to prevent any person from procuring any drug, or making any mixture, whether potent or without any therapeutical activity whatever (so long as it does not contain a scheduled poison), advertising it in any decent terms as a cure for any disease or ailment, recommending it by bogus testimonials and the invented opinions and *facsimile* signatures of fictitious physicians, and selling it under any name he chooses, on the payment of a small stamp duty, for any price he can persuade a credulous public to pay." It is difficult to add anything to this simple authoritative statement, but the question is how to remedy the evil it reveals. As the editor of *The World Today* observes, the quack medicine trade occupies a position of extraordinary power, for through their advertisements the proprietors largely control the press, and in this and other ways influence Parliament. Ten years ago the Select Committee pointed out the crying scandal of the present state of affairs, and, as the Committee prophesied, its report was allowed to drop unnoticed by the press, and for ten years nothing has been done in the matter. Sir Thomas Horder mentions many other familiar examples of the power of this trade to oppose legislation adverse to its interests, and even to suppress the spread of any information. *The World Today* deserves the gratitude of the public and the medical profession for publishing the present article; it is continuing the good work begun by its predecessor, *The World's Work*, which published in 1906 a scathing exposure of quack medicines. Legislation on the subject of patent medicines is long overdue, for at present this particular form of fraud is positively pampered by the Legislature; but the chief remedy undoubtedly lies in educating the public. The more the public know about the elementary laws of hygiene the less readily will they be exploited by quack medicine vendors, and Sir Thomas Horder points out that it is the duty and interest of the medical profession to further such education. The author takes as an instance the education of the public in self-medication in the case of minor common ailments. "A man will never go to a doctor for every headache that he suffers, nor every time that he is constipated—nor is it desirable that he should. But the salient point is this: he is surely running a much smaller risk if he attempts to correct the defect by a remedy the exact nature of which he and everybody knows, than by taking a patent medicine whose formula is secret, and may be changed from time to time without his knowledge." The medical profession, very rightly, has always been most suspicious of measures likely to encourage self-medication, but we think Sir Thomas Horder's statement of plain facts is unanswerable. There are a certain number of minor ailments which the public always have treated, and probably always will treat, by themselves, and the profession ought to do its best to see that the disadvantages and dangers of this practice are minimized as far as possible by the supply of accurate information.

ST. LUKE'S DAY SERVICE IN TORONTO.

The Toronto Academy of Medicine, the largest local medical organization in Canada, instituted this year an annual service on St. Luke's Day. Fellows of the Academy with their wives, together with many trained nurses from various hospitals, and a large body of medical students, assembled in the Convocation Hall of the University to the number of about one thousand. Before the service began the President, Dr. Harley Smith, outlined the action taken by the Academy as follows: "It is fitting that we, in this daughter Dominion, loyal as we are in our devotion to the Motherland, should follow her example in many things that tend to raise us to a higher plane of living. Sixty years ago some medical students in England organized a Guild of St. Luke. This was later extended so as to include medical graduates and associate members. During all these years there have gathered in St. Paul's and other cathedrals in the old land thousands of our

colleagues with students and nurses, many of them clad in academic robes, to worship the Divine Master of that disciple who, by his faithfulness in the practice of his profession and by his loving obedience to his Master, earned for himself the beautiful title of the Beloved Physician. His gospel has been described as the gospel of the rejoicing spirit of God our Saviour. The healing art has been recognized by the Saviour as an essential part of His work of reconciliation. Three years ago the then president of the Toronto Academy of Medicine had the happy thought of instituting a similar service in our city. The subject was further developed by his two successors and their respective councils, and last spring the Academy decided to hold this year the first St. Luke's Day service. The beautiful and appropriate order of service used on this occasion, dating back at least to the earlier half of the sixteenth century, was chosen by our immediate past-president, Dr. R. T. Noble, in conference with the librarian of one of our theological colleges. To stimulate and strengthen the members of a noble profession in faithful adherence to the highest ideals in their difficult work for mankind, and in their relations to one another, is one of the objects of our assembling to-day in this divine worship." The service was conducted by the Rev. A. L. Rose, rector of St. Mary Magdalene's Church, and the choir of the church, assisted by the Toronto University Glee Club, rendered the musical part of the service. The sermon was preached by the Rev. Provost Seager of Trinity College.

THE ROCKEFELLER FOUNDATION IN 1923.

THE annual report for 1923 of the Rockefeller Foundation[1] contains, in addition to the attractively written review by the President (Dr. G. E. Vincent), the more detailed reports of the general director (Dr. F. R. Russell) of the International Health Board, of the directors of the China Medical Board (Dr. Roger Greene), and of the Division of Medical Education (Dr. R. M. Pearce), the last of whom is familiar to many medical men in this country from his visits and their results. During 1923 the condition of scientific medical workers in Germany was so urgent that the Rockefeller Foundation granted 194 resident fellowships, which thus provide small stipends and sums for laboratory expenses; altogether in that year the Foundation supplied 636 individuals in twenty-nine countries with fellowship funds. The training of nurses has been studied, and as a result active steps have been taken to facilitate a more systematic organization of education with a shorter period of instruction (twenty-eight months) and the inclusion of public health in the course so as to obtain capable staffs of visiting nurses. The latest, and it is hoped the final, bout with yellow fever in Brazil recalls the memory of Oswaldo Cruz, who, before his death in 1917, had by his efforts "made Rio de Janeiro as safe as it is beautiful." The phrase "Parasites lost and Parasites regained," uttered by a Fijian schoolboy after listening on the same day to a talk on hookworm disease and an address on Milton, exactly describes what happens if the precautions so widely promulgated by the International Health Board are not properly obeyed. Since the Rockefeller Foundation began to take a part in medical education it has helped 117 medical schools in thirty-one countries, one of the conditions being that it contributes a part only of the funds needed for a given project, with the understanding that the remainder will be provided from other sources. The Pekin Union Medical College, built, equipped, and maintained by the Rockefeller Foundation through the China Medical Board, is carried on by well trained men and women from many parts of the world, the seventy-eight members of the medical school and hospital staffs coming from thirty-eight medical colleges in eleven different countries. During 1923 there were no less than eighty-five publications from this centre in the Orient, among which special attention should be directed to Dr. C. W. Young's account of improved methods for detecting and cultivating the parasite of kala-azar. It is difficult to express adequately our admiration for the way in which the Rockefeller Foundation is carrying out the purpose of its charter, "the well-being of mankind throughout the world."

[1] The Rockefeller Foundation: Annual Report for 1923. (Fcap. 4to, pp. xii + 389; 79 figures.

IN OPEN BOATS.

WITH the coming of the steamship and the passing of the beautiful sailing ship, the romance of the sea was considered past. But now and again something happens, a ship is wrecked or founders, and the old spirit of British seamanship reappears. When on June 4th, 1923, the news was first flashed over the world that an open boat containing survivors from the ss. *Trevessa* had landed at Rodrigues Island, a sense of pride as well as relief was felt by every man and woman of our race. The story has now been given to the public by Mr. Cecil Foster, captain of the ship, in a book entitled *Seventeen Hundred Miles in Open Boats*.[1] This plain unvarnished tale is practically the logs kept by the commanders of the two open boats that carried the crew of the *Trevessa* to safety—one to Rodrigues Island, the other to Mauritius. It is impossible to read the account of the hardships of crews crowded into open boats—exposed to all weathers, rationed in drinking water down to the bare limit which will support life—without recalling other famous exploits in which British sailors escaped innumerable dangers in a like manner. We are naturally reminded of Bligh's famous voyage, when his crew in the *Bounty* mutinied and sent their captain and the loyal members of his crew afloat in an open boat in the neighbourhood of the Friendly Islands. That was in the year 1789, the voyage ending when the starved and battered heroes arrived at the Dutch island of Timor. Another voyage, in many ways curiously like Bligh's, was that of Captain Edwards, who commanded H.M. frigate *Pandora*, which sailed in 1790 to the South Seas to hunt for the mutineers of the *Bounty* and bring back for trial any they could find. Edwards, who must have been a particularly hard and difficult commander to serve under, was undoubtedly a fine seaman, although he lost his ship on a reef through gross carelessness. The narrative of his long voyage in an open boat, which (like Bligh's) ended at Timor, was written by his surgeon, George Hamilton, who was among his crew who survived the voyage; this rare volume was published at Berwick in 1793. The accounts of these three voyages bring to light the fact that in each instance success was due to the stern discipline maintained by the commanding officer. Food, and still more water, had to be rationed to the smallest possible amount, while those who broke the rule that forbade the drinking of seawater always perished. Captain Foster had experienced the hardship of voyages in open boats during the war, when he was more than once torpedoed by German submarines. His experiences on those occasions had impressed him so much that he had often discussed with his chief steward in the *Trevessa* the question of how a lifeboat should be provisioned in the event of having to leave the ship on the high seas. Owing to this foresight on the part of the captain he was not taken altogether by surprise when the disaster came, for the steward knew exactly what provisions to put into the lifeboats. The three chief items were water, condensed milk, and cigarettes. The water had to be most sparingly issued, while generally the men's

[1] *Seventeen Hundred Miles in Open Boats.* By Cecil Foster, Master Mariner, Captain of the ss. *Trevessa*. London: Martin Hopkinson and Co., Ltd. (Demy 8vo, pp. xii+173; 49 photos, 2 maps, 1 chart. 10s. 6d. net.)

mouths were so dry that the biscuits issued for food were seldom touched. Again and again Captain Foster remarks on the benefit they all received from the cigarettes; smoking appears to have comforted and soothed the sufferers; indeed, Captain Foster, writing of this, says: "When indulged in it revived everyone's spirits and added the touch of cheerfulness necessary to enable us to carry on and keep smiling." The daily ration of water allotted to every man was one-third of a cigarette tin; this was issued at 2 o'clock in the afternoon, when the worst of the heat of the day was over. At 8 a.m. each man had a ration of milk—one cigarette-tin lid—and one biscuit, and another small ration of milk in the evening. While those who drank sea-water died of thirst, much relief was derived from bathing the head and body in sea-water, also from soaking the clothes in the sea, and, after partially wringing them out, putting them on again; the men who did this suffered less from thirst than those who relied only upon their ration of drinking water.

AUSTRALIAN MEDICAL PUBLICATIONS.

The Health Department of the Commonwealth of Australia is issuing a series of publications, under the authority of the Minister of Health, dealing with a variety of medical questions particularly as they interest the Australian practitioner. The authors are all men of experience in the matters on which they have written, and all are connected with the Institute of Tropical Medicine at Townsville, North Queensland. Though dealing primarily with tropical conditions as found in Australia, the subjects treated have a far wider range of application than that of a single continent, since it is by a scientific consideration of these and cognate matters that the oft-debated question of the ability of the white man to colonize and make his permanent home in the tropics will be finally decided. Pamphlet No. 6 of the series is concerned more directly with this problem, summarizing certain studies on acclimatization. This is stated to be a preliminary communication for which the well known studies of Breinl, Young, and others, issued some years ago from the Townsville institute, form the basis. Further information on this problem will be awaited with much interest. Four other pamphlets (Nos. 2, 3, 4, and 8) treat directly or indirectly with mosquitos. No. 2, a synonymic list of the more important Culicidae of the Australian region, by Mr. L. E. Cooling, entomologist on the staff of the institute, will prove very useful for future workers, and will save much time which would otherwise have to be spent in the tedious work of "running down" species of mosquitos. No. 8, by the same author, takes up the question of the bionomics of some of the commoner species mentioned in the preceding. Two other issues (Nos. 3 and 4) specialize on the mosquito-borne diseases, malaria and filariasis respectively. There are both written by Dr. Cilento, director of the institute. The former is of particular importance, since this disease has hitherto proved the most vital factor in preventing the successful permanent settling of the white man in the tropics; the latter comprises a general review of the subject of *Filaria bancrofti*, the parasite, the diseases to which it gives rise and their treatment, compiled from the standard textbooks and reports. Pamphlet No. 5, on the diagnosis of bowel diseases, is likewise mainly a compilation, though a valuable one. It deals with the prevalence of intestinal affections in Australia, dividing them into three main groups: helminthic, in particular ankylostomiasis; sprue, consisting largely of extracts from Dr. Manson-Bahr's writings; and the dysenteric group, amoebic and bacillary. The final pages, on helminthological matters, need considerable revision in the light of more recent work. Even though these publications contain little or no new matter, they will doubtless be very useful for the practitioner in Australia, for whose benefit they have been written. They will not only save him time in looking up points in larger textbooks, but they indicate when it is necessary or advisable to send material for special examination; they tell him how to take the specimens and how to interpret and evaluate the reports he receives from the laboratories. Though the issues before us consist largely of compilations they form an excellent foundation for the erection of a superstructure of new material, and if the standard is maintained when dealing with special subjects the series should in time prove as valuable as the publications of the Washington Bureau, and be as widely read.

GOLD TREATMENT OF TUBERCULOSIS.

For some time past Professor Holger Moellgaard and his fellow workers in Copenhagen have been investigating the direct chemical action of gold salts upon the tubercle bacillus. At a meeting of the Danish Medical Society held in Copenhagen on October 28th Professor Moellgaard gave a preliminary account of the experimental work and the clinical results, and we understand that full details are now in course of publication in book form in English. The method is a form of chemotherapy. A solution of the gold salt is injected intravenously or intramuscularly. Its destructive action on the tubercle bacillus appears to liberate a toxin, often with serious results to the patient. To neutralize this reaction a protective serum obtained from an immunized horse is administered beforehand. The constitution of the gold salt is said to be such that the risk of metallic poisoning is slight. Arrangements have been made for producing it in bulk in Denmark under the name "sanocrysin," but we understand that Professor Moellgaard is not making it generally available at present. He has asked the Medical Research Council to organize the investigation of its properties in this country. The new method of treatment is obviously one which should only be applied with great care, and with full knowledge of the laboratory and clinical tests already made.

The three hundredth anniversary of the birth of Thomas Sydenham will be commemorated at a meeting of the President and Fellows of the Royal College of Physicians of London at the College, Pall Mall East, on Wednesday next, November 12th. There will be a reception at 8.30 p.m., followed by a short address by the President, Sir Humphry Rolleston, Bt., K.C.B.

The Schorstein Memorial Lecture will be delivered by Sir Arthur Keith, F.R.S., in the anatomical theatre of the London Hospital Medical College on Wednesday, December 17th, at 4.15 p.m.; the subject chosen is the clinical importance of the bulbus cordis. The lecture will be illustrated by lantern slides. Members of the medical profession are cordially invited.

By an Order of the Privy Council, Professor E. P. Cathcart, C.B.E., M.D., D.Sc., F.R.S., Professor of Chemical Physiology in the University of Glasgow, has been appointed a member of the Medical Research Council in the place of Professor D. Noël Paton, M.D., F.R.S., who has retired.

Dr. Herbert R. Spencer will deliver the second David Lloyd Roberts Lecture on the renaissance of midwifery, illustrated by books and lantern slides, on Wednesday, November 19th, at 5 o'clock, at the house of the Medical Society of London, 11, Chandos Street, Cavendish Square.

BRITISH INSTITUTE OF RADIOLOGY.

In the diagnosis of disease radioscopy and radiography are being increasingly employed, and it is also recognized that radiotherapy constitutes a great advance in the treatment of many kinds of disease. Still greater progress would become possible if closer and more intelligent co-operation could be effected between radiologists and medical practitioners on the one hand, and between radiologists, physicists, and technicians on the other. The interest of medical practitioners generally would be deepened and their more effective co-operation secured if convenient opportunities were afforded them of observing the improvements that are being made in the application of radiology to diagnosis and treatment.

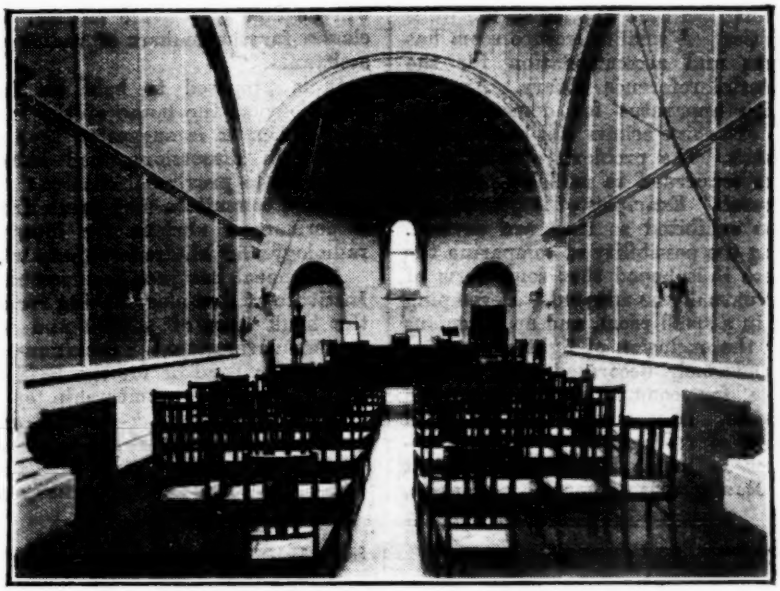

FIG. 1.—The Lecture Hall—old church of the Russian Embassy.

Isolated radiologists often encounter problems the solution of which is rendered difficult by the want of necessary apparatus and advice. Comparison of technique and methods is necessary, and facilities are very desirable for testing suggestions made by workers who, though in actual practice, have inadequate laboratory equipment. The practice of radiology is inevitably associated with the use of apparatus, upon the efficiency of which the excellency of the work must depend. If the manufacturer of this apparatus is clearly aware of the requirements of the medical radiologist, and of the nature of any projected research, he could in many cases make valuable suggestions and provide the necessary facilities. Consultation between the two would result in improvements in the design and detail of apparatus, which would lead to further advances in diagnosis and treatment. In this country there has been so far less co-operation between technicians, physicists, and medical radiologists than in other countries, and it is indisputable that the British prestige in such matters would be enhanced by the mutual association made possible by a central institute, the membership of which would combine representatives of all the interests involved and through which a general co-ordination of individual efforts could be established.

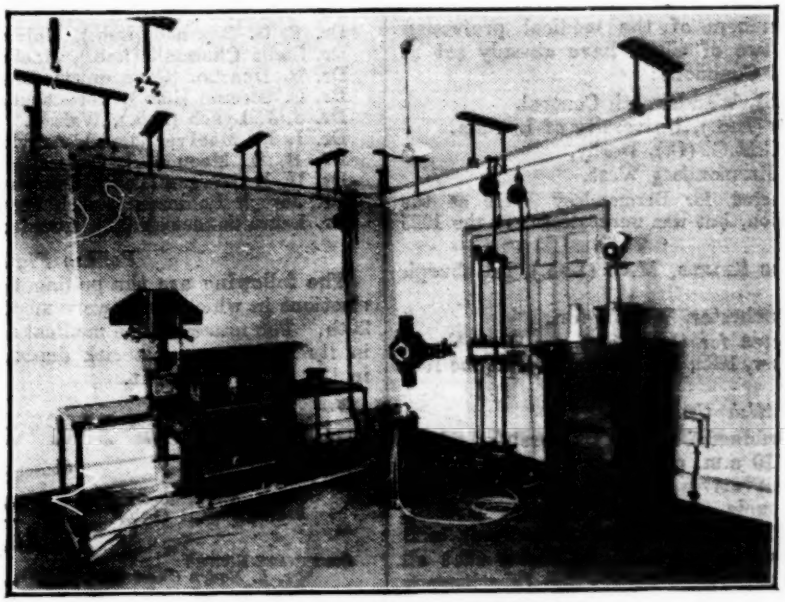

FIG. 2.—A corner of the Demonstration Room.

Origins and Aims of the Institute.

In the spring of 1923 a committee, under the chairmanship of the late Sir Archibald Reid, was formed for this purpose, representatives being included in it from the Royal Society of Medicine, the Röntgen Society, and the British Association for the Advancement of Radiology and Physiotherapy. This committee having considered for some time the establishment of a central organization along the lines just indicated, resolved to found a British Institute of Radiology, and issued a preliminary and limited appeal for funds. The nucleus of a library had already been provided by Lady Mackenzie Davidson, who had presented to the Institute the valuable collection of books which had belonged to her husband. In addition to this a definite status had been conferred upon the Institute by the action of the trustees of the Mackenzie Davidson Fund in handing over to the organizing committee of the Institute the sum of money collected. With this money the purchase price of the lease of 32, Welbeck Street, London, was paid, and it was estimated that the completion of the equipping of the premises would involve a further initial expenditure of about £2,000, towards which there was a balance from the Mackenzie Davidson Fund of £300. Sir Archibald Reid was actively engaged in the detail of the work of establishing the Institute when his death last January deprived the organization of a great driving force.

In April, 1924, articles of association of the British Institute of Radiology were adopted and confirmed with the sanction of the Board of Trade, this being achieved by the alteration of title of the pre-existing British Association for the Advancement of Radiology and Physiotherapy, among whose main objects had been the formation of such an institute.

The objectives of the British Institute of Radiology are as follows: (*a*) to promote the advancement of radiology and physiotherapy on scientific lines under the direct control of the medical profession, protecting in every way possible the interests of those engaged in these subjects; (*b*) to secure legislative improvements in this connexion; (*c*) to provide for the delivery of lectures, the holding of classes and examinations, the establishment of scholarships, and the granting of prizes, diplomas, and certificates; (*d*) to arrange for the publication of papers, communications, or treatises; (*e*) to promote and provide for research in experimental work, and to establish grants and rewards in connexion therewith; (*f*) to establish and maintain

a library and museum, and to organize exhibitions of apparatus; (*g*) to establish charitable and benevolent funds for the benefit of persons engaged in radiology and physiotherapy.

Equipment of the Institute.

The property in Welbeck Street includes the old church of the Russian Embassy, which has now been adapted to serve as a lecture hall. Heating apparatus has been installed, and a special lining has been applied to the walls so as to improve the acoustics. A smaller lecture room has been equipped with desks and accommodation for the Mackenzie Davidson memorial reference library. Another room has been fitted with apparatus for demonstration purposes, and part of the extensive cellars will be available for individual research work. The problems of diagnostic technique and the physics concerned in radiology provide also opportunities for research. Examples of improvements in apparatus will also be exhibited as they are devised. With a view to establishing the possibility of comparing the results of different workers it is hoped that some form of standard technique may eventually be adopted. Developing tanks have been installed in a small room, and an ingenious arrangement provides for the exclusion of light even when the door is open. A handsomely decorated room on the ground floor is available for committee meetings and meetings of affiliated societies. In memory of Sir Archibald Reid a reference collection of radiograms is being established; this was a matter in which he took very great interest during his life. Radiograms of normal conditions, as well as of such diseased conditions as osteomyelitis, tuberculosis, and bone growths, will be carefully collected, and duplicate sets will be prepared for the use of medical schools or individual lecturers where facilities exist for their demonstration. Lantern slides of these radiograms will also be prepared, and will be available for loan. These lantern slides will be of great value in radiological teaching in medical schools, and it is probable that a syllabus of lectures will eventually be drawn up. The Institute also will be able to provide medical post-graduate courses and classes for the makers of radiological apparatus and their assistants.

It is proposed to hold an International Congress of Radiology at the house of the Institute in the summer of 1925, when it is suggested that four days should be employed in discussions, and subsequent visits should be arranged to provincial centres. It is hoped that an international committee may result from the congress, and that a permanent nucleus for international collaboration on radiology and kindred subjects will be so initiated.

An appeal has just been issued on behalf of the British Institute of Radiology asking for a sum of £6,000 to pay off the bank loan of £2,000 and to provide a nucleus for further development. Donations are invited to the general foundation fund or for the Reid memorial collection. The subscription for membership of the Institute, including receipt of the *British Journal of Radiology*, is 3 guineas annually, and there is a fee of 1 guinea payable on entrance; the subscription for life membership is £30; associates pay 10s. 6d. on entrance and £1 11s. 6d. annually.

THE GENERAL ELECTION.

Medical Members of the New Parliament.

The following five medical men who were members of the last Parliament have been re-elected to the House of Commons at the recent general election:

Dr. Walter E. Elliot, M.C. (C.), Glasgow, Kelvingrove.
Dr. F. E. Fremantle, O.B.E. (C.), St. Albans.
Dr. L. Haden Guest (Lab.), Southwark North.
Professor Thomas Sinclair (C.), Queen's University, Belfast. Returned unopposed.
Dr. J. H. Williams (Lab.), Llanelly.

New Members.

The following six members of the medical profession have also been elected, two of whom have already sat as members of the House of Commons:

Sir Henry Jackson (C.), Wandsworth Central.
Dr. E. Graham Little (Ind.), University of London.
Sir Richard Luce, K.C.M.G. (C.), Derby.
Dr. A. Salter (Lab.), Bermondsey West.

Dr. Salter was elected for Bermondsey West at the November, 1922, election, but was unsuccessful in the 1923 election.

Dr. Thomas Drummond Shiels, M.C. (Lab.), Edinburgh East.
Dr. T. Watts (C.), Manchester, Withington.

Dr. Watts was elected for the Withington Division of Manchester in November, 1922, but was defeated at the 1923 election.

The Scottish Universities.

The polling for the combined Scottish Universities (three seats) will not close till 10 a.m. on Tuesday next. At the last election two Conservatives and one Liberal were returned unopposed—namely, Sir Henry Craik, K.C.B., and Sir George Berry, F.R.C.S.Ed. (Conservatives), and Mr. D. M. Cowan (Liberal). It is to be hoped that all medical practitioners who have votes in this constituency will take their part in the election, for which there are several new candidates. Sir George Berry is the only medical man standing, but it will be remembered that Sir Henry Craik is an honorary member of the British Medical Association and a valued friend of Medicine in Parliament.

Unsuccessful Candidates.

The following four medical men who sat in the last Parliament were defeated at the polls—namely: Dr. W. A. Chapple (L.), Dumfriesshire, who represented Stirlingshire from 1910-18 and Dumfriesshire since 1922; Mr. Somerville Hastings (Lab.) was elected in 1923 to represent Reading; Dr. G. E. Spero (L.), Stoke Newington, who, after being an unsuccessful candidate at Leicester in the 1922 contest, was elected to represent Stoke Newington in 1923; Lieut.-Colonel T. S. Beauchamp Williams (Lab.), Kennington, who was elected in 1923 to represent the Kennington Division of Lambeth.

The following members of the profession were also unsuccessful. Several of them had previously represented or contested either the same or other constituencies.

The Right Hon. C. Addison (Lab.), Hammersmith South.
Dr. Ethel Bentham (Lab.), Islington East.
Sir John Rose Bradford (C.), University of London.
Dr. F. G. Bushnell (Lab.), University of London.
Dr. Stella Churchill (Lab.), Hackney North.
Dr. R. Dunstan (Communist), Birmingham West.
Dr. O. Gleeson (Lab.), Portsmouth North.
Dr. J. J. Lynch (Ind.), Walsall.
Dr. I. H. MacIver (Lab.), Argyllshire.
Dr. R. O. Moon (L.), Oxford.
Dr. H. B. Morgan (Lab.), Camberwell North-West.
Dr. Joseph Robinson (Lab.), Stretford.
Dr. Laura Sandeman (C.), Aberdeen North.

Polling Figures.

The following are the polling figures at all the contested elections in which there were medical candidates on October 29th. The names of the medical representatives are printed in italics, and an asterisk denotes that the candidate sat in the last Parliament.

Glasgow, Kelvingrove:	
**Dr. Walter E. Elliot, M.C.* (C.)	18,924
T. Kerr (Lab.)	12,844
Conservative majority	6,080
St. Albans:	
**Dr. F. E. Fremantle* (C.)	18,004
Frank Herbert (Lab.)	8,682
Conservative majority	9,322
Southwark North:	
**Dr. L. Haden Guest* (Lab.)	8,115
E. A. Strauss (L.)	7,085
J. J. Llewellin (C.)	3,305
Labour majority	1,030
Wandsworth Central:	
Sir H. Jackson (C.)	13,234
C. Latham (Lab.)	8,235
Conservative majority	4,999
University of London:	
Dr E. Graham Little (Ind.)	3,202
Sir J. Rose Bradford (C.)	2,813
Professor A. F. Pollard (L.)	1,539
Dr. F. G. Bushnell (Lab.)	1,087
Independent majority	389

DERBY:
*Right Hon. J. H. Thomas (Lab.) ... 27,423
Sir Richard Luce (C.) ... 25,425
*W. R. Raynes (Lab.) ... 25,172
Mrs. E. J. Hulse (C.) ... 21,700
J. H. Stewart (L.) ... 7,083
Labour majority ... 2,251
Conservative majority ... 253

BERMONDSEY WEST:
Dr. A. Salter (Lab.) ... 11,578
*Rev. R. M. Kedward (L.) ... 8,676
Labour majority ... 2,902

EDINBURGH EAST:
Dr. T. Drummond Shiels (Lab.) ... 9,330
C. Milne (C.) ... 6,105
*J. M. Hogge (L.) ... 5,625
Labour majority ... 3,225

MANCHESTER, WITHINGTON:
Dr. T. Watts (C.) ... 13,633
*E. D. Simon (L.) ... 10,435
E. Whiteley (Lab.) ... 2,467
K. Burke (Ind.) ... 236
Conservative majority ... 3,198

LLANELLY:
Dr. J. H. Williams (Lab.) ... 20,516
R. T. Evans (L.) ... 18,257
Labour majority ... 2,259

HAMMERSMITH SOUTH:
*Right Hon. Sir William Bull (C.) ... 12,679
Right Hon. C. Addison (Lab.) ... 8,804
E. Welton (L.) ... 1,393
Conservative majority ... 3,875

ISLINGTON EAST:
Major R. Tasker (C.) ... 14,174
Dr. Ethel Bentham (Lab.) ... 10,280
*A. S. Comyns Carr (L.) ... 7,406
Conservative majority ... 3,894

DUMFRIESSHIRE:
General J. Charteris (C.) ... 12,718
Dr. W. A. Chapple (L.) ... 8,472
Mrs. A. Dollan (Lab.) ... 6,342
Conservative majority ... 4,246

HACKNEY NORTH:
Captain A. Hudson (C.) ... 11,975
*J. H. Harris (L.) ... 7,181
Dr. Stella Churchill (Lab.) ... 6,097
Conservative majority ... 4,794

BIRMINGHAM WEST:
*Right Hon. Austen Chamberlain (C.) ... 14,801
Dr. R. Dunstan (Communist) ... 7,158
Conservative majority ... 7,643

PORTSMOUTH NORTH:
*Major Sir Bertram Falle (C.) ... 17,597
Dr. O. Gleeson (Lab.) ... 10,279
Conservative majority ... 7,318

READING:
H. G. Williams (C.) ... 21,338
Mr. Somerville Hastings (Lab.) ... 18,337
Conservative majority ... 3,001

WALSALL:
W. Preston (C.) ... 15,168
*Pat Collins (L.) ... 12,734
Captain L. Small (Lab.) ... 11,474
Dr. J. J. Lynch (Ind.) ... 622
Conservative majority ... 2,434

ARGYLLSHIRE:
F. A. Macquisten (C.) ... 9,240
*Right Hon. Sir W. Sutherland (L.) ... 6,211
Dr. I. H. MacIver (Lab.) ... 4,532
Conservative majority ... 3,029

OXFORD:
*R. C. Bourne (C.) ... 12,196
Dr. R. O. Moon (L.) ... 6,836
F. Ludlow (Lab.) ... 2,260
Conservative majority ... 5,360

CAMBERWELL NORTH-WEST:
E. T. Campbell (C.) ... 9,626
Dr. H. B. Morgan (Lab.) ... 9,432
*Right Hon. T. J. Macnamara (L.) ... 5,138
Conservative majority ... 194

STRETFORD, LANCS:
*Sir T. Robinson (L.) ... 20,826
Dr. Joseph Robinson (Lab.) ... 11,520
Liberal majority ... 9,306

ABERDEEN NORTH:
*F. Rose (Lab.) ... 13,249
Dr. Laura Sandeman (C.) ... 8,545
Labour majority ... 4,704

STOKE NEWINGTON:
H. G. Jones (C.) ... 10,688
Dr. G. E. Spero (L.) ... 4,758
L. Silkin (Lab.) ... 3,420
Conservative majority ... 5,930

LAMBETH, KENNINGTON:
George Harvey (C.) ... 14,898
Lieut.-Colonel T. S. Beachamp Williams (Lab.) ... 11,572
Conservative majority ... 3,326

England and Wales.

RABIES IN ENGLAND AND WALES.

ON July 12th, 1919 (p. 50), we referred to the issue by the Ministry of Health of a revised memorandum on the procedure to be adopted in the case of a person bitten by a dog suspected of being rabid. The Minister of Health has now stated that in view of the disappearance of this disease in England and Wales, no case having occurred since December, 1921, he has decided that special arrangements for antirabic treatment are no longer necessary. A further revision of the memorandum with regard to treatment has therefore been issued, and it is announced that arrangements may still be made with Professor Dudgeon (Department of Pathology, St. Thomas's Hospital, S.E.1) for antirabic treatment with carbolized vaccine prepared at the Ministry's laboratory. The cost of the treatment and other expenses must be borne by the patient or by local sanitary authorities. The centres for treatment at Plymouth, Cardiff, Birmingham, Manchester, and Newcastle-upon-Tyne have accordingly been closed. In the revised edition there is no other radical change, as compared with the earlier memorandum, and the concluding paragraph repeats the injunction to use all possible expedition in following the procedure laid down.

FINANCE OF LONDON HOSPITALS.

Under the direction of the Hospital Economy Committee of King Edward's Hospital Fund for London, a statistical report has been published based on the accounts of 116 hospitals and on returns made to the Fund. General particulars of the work and accommodation in these hospitals are given, and their incomes and ordinary expenditures are analysed so that the cost of working in respect of the more controllable items of expenditure can be estimated. The tables which deal with working costs will assist hospital managers in controlling expenditure and in avoiding increases in cost which are not associated with increase in the quantity or quality of the work. The expenditure in each hospital is compared with the expenditure in other hospitals and with the average of those hospitals with which it is most comparable. Increases common to all hospitals can thus be distinguished from those peculiar to any particular institution. Hospital managers may in this way find out whether at their own hospitals the cost appears to be unduly high, and, if so, in what departments the cause of the excess is present. They can thus reduce it wherever it cannot be justified, and so carry out one of the recommendations of Lord Cave's committee for the re-establishment of the finances of the voluntary hospital system. In a general review of hospital work it is stated that between 1921 and 1923 there was an increase in the available beds of 360, but a decrease in the average occupied beds of 130, leaving a net increase in 1923 over 1913 of 1,200 available beds, and 330 average occupied beds. This contrast is due to several causes, the chief of which was that six hospitals, aggregating 542 beds, were entirely closed to in-patients during 1923 for periods ranging from three to ten months. Between 1921 and 1923 there was an increase of 3,600 new patients, resulting in a net increase in 1923 over 1913 of 22,600. The patient rate per bed also increased: in 1913 it was 14.3; in 1921, 15.5; in 1922, 15.6; and in 1923, 16. This increased rate of work may be stated in another way—namely, that the average duration of stay for each patient fell from 25.5 days in 1913 to 23.5 in 1921, and 22.8 in 1923. The income of these 116 hospitals apart from special distributions—as, for instance, emergency grants from the King's Fund and from the National Relief Fund—increased from £2,415,000 in 1922 to £2,857,000 in 1923. An outstanding feature of this last year was the large total of legacies, which aggregated £473,000; of this £247,000 came from a single source. Discounting such factors, however, it may be stated that since 1920 the income of the hospitals from normal sources shows a steady increase. The hospital expenditure in 1923 was £2,630,000, an increase of £40,000 over 1922, but representing a considerable drop since 1913,

when the figure was £2,813,000. From the figures of hospital work set out it is obvious that the greater part of this fall in expenditure is not due to decrease in the volume of work, but to reduction in cost. The most critical year for the voluntary hospitals in London was 1920, when the gap between income and expenditure was at its widest. The improvement, which began in 1921 and continued in 1922, is shown to have bridged the gap in 1923, when, for the first time in the post-war period, the total general fund expenditure, taking the hospitals as a whole, was met out of the revenue of the year from normal sources. The improvement may also be indicated by taking the figures of surpluses and deficits separately. Thus in 1922, 60 hospitals had surpluses for the year amounting to £67,000, and 56 had deficits amounting to £242,000; while in 1923, 62 hospitals had surpluses amounting to £382,000, and 54 had deficits amounting to £155,000.

The London County Council Mental Hospitals.

During the three months ending September 30th the number of new patients admitted to the nine mental hospitals under the control of the London County Council was 794, and the number transferred to them from some other institution 195. During the same period 218 patients were discharged recovered, 168 relieved, and 219 died. The number on the register on September 30th was 18,374. At Maudsley Hospital the number of private boarders admitted during the quarter was 103; 90 were discharged, 13 died, and the number remaining in residence is 135. In the out-patients' department of this hospital 197 persons (64 men, 117 women, and 16 children) have received treatment since its opening. The London County Council has given permission for the Eugenics Education Society to take photographs at mental institutions for use in the production of a "eugenic film" for educational purposes. These photographs are to contain no recognizable portraits of patients.

Salaries of L.C.C. Medical Officers.

The London County Council Establishment Committee is recommending that the maximum basic salary of three principal assistant medical officers should be increased by £100 a year, making the scale in each case £700, rising by annual increments of £50 to £1,000 a year (instead of £900 as hitherto), based on pre-war conditions. This last provision means that a salary nominally of £1,000 a year will be subject to temporary additions making it at the present time £1,219. The officers concerned are Dr. McC. Wanklyn, Dr. J. A. Brincker, and Dr. N. D. Bardswell, and in regard to their work the following considerations are put forward by the committee. The first officer is concerned with general public health matters, in particular in connexion with small-pox, typhus fever, etc., and it is pointed out that the task of safeguarding the population of London against the introduction of such diseases from abroad has become much more onerous owing to the existing conditions on the Continent and the removal of migration restrictions which existed during the war. The second officer is in charge of the bacteriological laboratory and the control of infectious diseases in schools. The demands on the laboratory have increased with the development of the school medical service and the opportunity afforded by a large staff of school doctors for the more frequent visitation of schools. The third officer has to do with the administration of sanatorium benefit, and must necessarily be an expert in the diagnosis of tuberculosis and a clinician of the first rank.

Central Association for Mental Welfare.

The Board of Education issued on September 12th a circular (No. 1341) in which important suggestions were made regarding the supervision of defective children up to the age of 16 and their further protection after that age. The Central Association for Mental Welfare has just issued a memorandum to local education authorities drawing special attention to this circular and offering its help in the carrying out of these suggestions. The branches of the Mental Welfare Association are mainly concerned in the care of defective children and adults in their own homes. This care is exercised in the following ways: (1) Friendly visits in the home of the defective; (2) advice to the parents as to the best methods of training and teaching; (3) teaching the defectives simple handicrafts; (4) systematic inquiry as to possible employment for defectives in the area, and supervision of defectives when employed; (5) providing occupation centres for young defectives. These centres are arranged for defective children excluded from special schools notified to the local control authorities; defective children of the lower feeble-minded grade excluded from elementary schools but for whom no special school is available; young defectives over 14 unemployable in ordinary industries. Fifty of these centres have already been established by local mental welfare associations and have given ample proof of success. The administrative machinery for carrying out this work is simple, efficient, and economical. A small voluntary committee composed of representatives of authorities (local education authorities, mental deficiency committees, and Poor Law guardians) and of societies engaged in social work is formed. A paid secretary and visitor is appointed and a paid supervisor for occupation centres where these are opened. Payments for such committees are received from the local education authorities. In addition, special grants are received from the Board of Control and the local authority under the Mental Deficiency Act for the expense of the occupation centre.

The association desires to assist local authorities in forming local mental welfare associations. The honorary secretary, Miss Evelyn Fox, will be glad to visit any area where the authorities are considering plans for carrying out the suggestions in the Board's circular and to explain the methods to be adopted. The association has also a staff of competent organizers whose services can be placed at the disposal of any authority for organizing and starting the work. The charge merely covers the salary of the organizer for the time being (at the rate of about £5 per week) and out-of-pocket travelling expenses. The organizer can also train a local worker to take up the permanent post. Two points are specially emphasized: the local Mental Welfare Association would work under the direction of the responsible officers of the authorities from whom payments are received, thus avoiding any overlapping; co-operation with the mental deficiency committees ensures the continuity of care of the individual defective from childhood onwards. The memorandum is signed by Sir Leslie Scott, K.C., M.P. (President); Dr. H. B. Brackenbury (Chairman, Education Committee); Dr. A. F. Tredgold, and the Honorary Secretary. It is to be hoped that all education authorities in whose areas there is not a local association for mental welfare will welcome the help and co-operation of the Central Association in establishing these.

Appointments at the Bristol Royal Infirmary.

Dr. Stuart Hardy Kingston has been appointed dermatologist to the Bristol Royal Infirmary. This is a new post. Formerly one of the physicians had charge of skin cases as well as medical. Dr. J. A. Nixon resigned the skin department on being appointed professor of medicine in the University of Bristol, but remains physician at the Infirmary. Mr. Eric Watson-Williams, *M.C.*, M.Ch., son of Dr. P. Watson-Williams, has been appointed assistant surgeon to the ear, nose, and throat department.

Scotland.

University of Edinburgh.

At a meeting of the General Council of Edinburgh University, held on October 31st, Principal Sir Alfred Ewing reported that the number of students who had matriculated for the year 1924 up to date was 3,541, as against 3,379 at the corresponding date last year. There was a definite reason for this increase: this year, for the first time, a penalty was attached to those who did not matriculate before the end of October. At the same time he did not think that the figures showed there was going to be any large falling off in the total numbers for the coming session as compared with last session. At a graduation ceremony, held in the Old University on October 27th, the Principal referred to the loss which the University had

sustained by the death of Professor Alexis Thomson (Surgery) and Professor Hunter (Public Health) in the Faculty of Medicine. He also referred to the fact that during the past year the number of matriculated students had included 1,195 women. A great social change was indicated by the comparatively large number of women now entering the University and by the fact that there was not a single faculty in which women were not represented; even in the Faculty of Divinity during the past year there had been two women students. The falling off of students in the Faculties of Medicine and Science had been serious, although there had been an increase in the Faculty of Arts to balance this. The decrease in numbers was, however, a serious financial loss to the University, which had necessitated reduction of the staff and the making of other small economies.

New Professor of Surgery in Glasgow.

The governors of the Anderson College of Medicine, Glasgow, have appointed Mr. James Russell, M.B., F.R.C.S., to the chair of surgery in the Anderson College, rendered vacant by the appointment of Professor Young to be Regius Professor of Surgery in the University of Glasgow.

Glasgow University Medico-Chirurgical Society.

At the opening meeting of this society Lieut.-General Sir William Leishman, Director-General of the Army Medical Department, delivered an address to the students on "The army as a field of medical research." He referred to the high place taken by Glasgow students in research work in the army and elsewhere, and emphasized the fact that such work was not necessarily confined to the laboratory. He described the various kinds of research work carried on in the army under peace conditions, and outlined the training necessary for such work.

Aberdeen University Rectorial Election.

The election of a Lord Rector for Aberdeen University takes place to-day (Saturday, November 8th). The candidates nominated are the Viscount Cecil, K.C., who has been nominated by the Unionists; Lord Meston of Agra, a former pupil of Aberdeen Grammar School and alumnus of Aberdeen University, who has been nominated by the Liberals because of his distinguished career in the Civil Service; and the Right Hon. C. P. Trevelyan, M.P., Minister of Education under the Labour Government, who has been nominated as Labour candidate. The retiring Rector is the Right Hon. Sir Robert Horne, K.C., M.P., a former Chancellor of the Exchequer.

Physical Training in Scottish Schools.

The Carnegie Dunfermline Trustees, at a meeting last week, had before them a report from the Committee of the Dunfermline College of Hygiene and Physical Education regarding an important development in the work of the college. For some years the Trustees have offered facilities to qualified male teachers to take a course of one year at the college and so add a qualification in physical training to their general certificate, but until the present year this course had attracted no applicants. Last month the Glasgow Education Authority, in view of the lack of suitable instructors of physical education, had agreed to give a year's leave of absence to seven of their staff in order to enable them to proceed to the Dunfermline College for the purpose of taking this one year's course in physical training. It was reported to the Trustees that several other education authorities had the matter under consideration, and it is expected that some of these will follow the example set by the Glasgow authority.

Care of the Feeble-minded in Scotland.

The fourth annual conference of the Scottish Council of Women Citizens' Associations was held last week at Falkirk. At the concluding meeting Lady Leslie Mackenzie, chairman of the Council, moved a resolution that the establishment throughout Scotland of residential industrial communities for the permanent care of the feeble-minded should be taken in hand without delay. She felt that the time had come for the women of Scotland to band themselves together to secure the rectification of defects in civilization so that people who could not care for themselves should be permanently cared for. This did not affect the insane, but that class of people who were born with mental defects, and who could not develop sufficiently no matter how much education and training they were given. In 1906 an Act had been passed by Parliament allowing school boards to educate these children in special schools, but this protection stopped at the age of 16 years, when they were turned out into the world. Some of them got employment which they were able to hold only for a short time, with the result that many gravitated to poor-houses or penal institutions instead of leading lives which might be made useful, happy, and safe in a normal environment. A colony system had been established in several English counties, under which mental defectives of all ages were kept under permanent supervision and given work for which they were suited. Such colonies had also been established experimentally in other countries. The Women Citizens' Council had decided to collect sufficient money for the establishment of such a colony in Scotland, and it was a work which women should be proud to undertake. Dr. R. D. Clarkson, Medical Superintendent of the Royal Scottish Institution for the Feeble-minded at Larbert, seconded the motion. He said that thirty years of experience in this work had convinced him that on the solution of the problem of the feeble-minded the solution of many other social problems depended. Feeble-minded persons turned loose in the community became drunkards, paupers, and inmates of rescue homes; their condition then became incurable. The institution at Larbert had been established over sixty years ago, mainly by philanthropists and doctors who thought that by such education for five or six years mental defectives might be transformed into normal citizens. After many years of experiment, however, it was found that if a child was mentally defective it would remain so for life, and the best thing for many of them was to be kept in institutions or colonies all their lives, where they could be trained for some particular work in the colony and could be drafted out for work in the fields and for hand work of various kinds, thus diminishing the cost of their maintenance. Teaching mental defectives was a matter requiring a special gift, not necessarily of an intellectual type. Many mental defectives were well adapted to look after persons more feeble-minded than themselves, and would go on doing it for years without feeling it so great a burden as it would become to more highly strung people. Plenty of work would be found for a colony if one were to be established. The motion was unanimously carried.

West of Scotland Foreign Service Medical Club.

The sixth annual meeting and dinner of this club was held in the Grosvenor Restaurant, Glasgow, on October 28th, under the presidency of Lieut.-Colonel John McKie, D.S.O., T.D. The large gathering included the following as guests: Major-General H. L. Reed, V.C., C.B., C.M.G., General Officer Commanding 52nd (Lowland) Division; Lieut.-Colonel G. H. Rae Gibson, D.S.O., East of Scotland Overseas Medical Club; Dr. W. T. Gardiner, *M.C.*, honorary secretary, East of Scotland Overseas Medical Club; Major J. D. Richmond, D.S.O., O.B.E., Senior Medical Officer, Maryhill Barracks, Glasgow. After the toasts of "The King" and "Our Fallen Comrades" had been given from the chair, the toast of "The Club" was proposed by Lieut.-Colonel George Gibson of Edinburgh in a humorous speech, to which the President suitably replied. General Reed expressed appreciation of the work of his comrades in the R.A.M.C., and of the large body of practitioners who served in the great war. A varied musical programme added greatly to the enjoyment of the evening, and to this Drs. Laird, Wright Thomson, Wallace Anderson, Gibson, Gardiner, Templeton, McKie, Adam Burns, and Scouler Buchanan contributed. Officers were appointed for next year as follows: President, Dr. John M. Cowan; Vice-President, Dr. W. B. Armstrong; Honorary Secretary and Treasurer, Dr. David Shannon.

Central Midwives Board for Scotland.

At a meeting of the Central Midwives Board for Scotland for the hearing of penal cases, Dr. Michael Dewar, deputy chairman, presiding, a certified midwife appeared in answer to charges of negligence and breaches of the rules and also failure to notify immediately a case of ophthalmia neonatorum, which were found proved. In order to give her an opportunity of proving amendment, sentence was postponed for reports at the end of three months from the local supervising authority on her conduct and methods of practice, and also at the end of six months. Failing satisfactory reports being received the secretary was instructed to remove her name from the roll.

Nurses' Examination in Scotland.

The number of nurses who presented themselves for the preliminary examination in all subjects held recently by the General Nursing Council for Scotland was 94, of whom 69 passed in anatomy and physiology, 70 in hygiene, and 77 in elementary theory and practice of nursing. In addition, a number of candidates who had failed at a previous examination presented themselves again, and of those 21 passed in the subjects for which they appeared.

Co-operation in Chemistry.

The first joint meeting for the present session of the Edinburgh and East of Scotland sections of the Institute of Chemistry and of the Society of Chemical Industry was held on October 22nd in the hall of the Pharmaceutical Society, York Place, Edinburgh, Dr. Alexander Lauder presiding. An address was delivered on "Co-operation in chemical science" by Mr. W. J. Woolcock, C.B.E., President of the Society of Chemical Industry. The lecturer especially dealt with the activities of various chemical societies which had organized exhibits in the industrial section of the British Empire Exhibition, and he pressed for a closer co-operation between chemists and those who develop chemistry in the various industries, with a view to the mutual advantage of both types of activity.

Correspondence.

TONSILLECTOMY.

Sir,—The three resolutions regarding tonsillectomy passed unanimously at the meeting of the Section of Laryngology and Otology at the Annual Meeting of the British Medical Association (British Medical Journal, November 1st, p. 813) are presumably idealistic, but the first resolution, at any rate, surely goes too far. It says "that tonsillectomy by enucleation is the only efficient operation in dealing with tonsillar disease."

Tonsil enucleation came into vogue only towards the end of the twelve years during which I was in charge of the throat department at Guy's, but I refuse to believe that every one of the hundreds of tonsil operations, excepting those of enucleation, for which I was responsible was a failure. As a fact I know that this was not so, and it must be common knowledge that enormous numbers of patients have been cured of their throat troubles by partial removal of their tonsils with a guillotine. Of course there are failures, but so also are there failures after enucleation. Unsuspected remnants have given rise to further troubles after the operation in a few of my own cases, and I have been consulted on various occasions by patients whose tonsils well known laryngologists had failed to completely enucleate.

Tonsillectomy by enucleation is therefore not the *only* efficient operation, although it is without doubt the *most* efficient.

But even if the most efficient, is it in all circumstances the most desirable? Is the practitioner—whoever and wherever he be—to feel that he is in duty bound to attempt the major operation of enucleation rather than the minor one of guillotining when called upon to treat cases of hypertrophied tonsils? In my humble opinion this would be asking too much, and would certainly result in an increase in the proportion of unsatisfactory results. It may, of course, be argued that tonsils should only be removed by those specially skilled in the operation of enucleation. This is perfectly correct, but I doubt whether there is a sufficiency of skilled operators for the work; further, it must be remembered that many of these operations are, and always will be, undertaken by those who no doubt do their best but who have no great amount of skill.—I am, etc.,

London, W.1, Nov. 3rd. F. J. Steward.

TREATMENT OF EXOPHTHALMIC GOITRE WITH INSULIN.

Sir,—The idea of treating hyperthyroidism with insulin, described in the important paper by Dr. R. D. Lawrence in the Journal of October 25th (p. 753), has probably occurred to many clinical physicians. During the latter part of 1923, and in the earlier months of this year, I used insulin in the treatment of three such cases. In one of them the hyperthyroidism was associated with the presence of adenomata of the thyroid, and no improvement resulted; the other two cases both improved to a remarkable degree, but as the improvement was estimated purely on clinical grounds I could not consider that insulin had been shown to be the decisive factor in the treatment. I was sufficiently impressed, however, with the possibilities of insulin in this connexion to resolve that at the first opportunity I would treat a case of acute Graves's disease with it. A recent experience has so completely confirmed this impression that I venture to record the particulars at some length.

On October 19th (before the publication of Dr. Lawrence's paper) I was asked by Dr. A. W. Weston of Dudley to see a woman of middle age who, three weeks previously, had developed acute exophthalmic goitre. One of her sisters had died of the same disease and another, I am told, has hyperthyroidism. When I first saw the patient she was almost maniacal; she moaned and cried incessantly and threw herself continually about the bed, incoherently complaining of violent upper abdominal pain. Vomiting was frequent and distressing; she had kept nothing down for four days. All the cardinal signs of Graves's disease were present: the eyes were prominent and staring; the thyroid was diffusely and markedly enlarged and a thrill was palpable over it; the hands were tremulous and sweaty; the pulse rate was 150 to the minute, and occasionally a beat was missed.

In view of the obvious gravity of her condition, Dr. Weston and I were doubtful if the risk of her removal to the General Hospital in Birmingham, ten miles away, should, properly, be faced, but the unsuitability of the home surroundings for insulin or any other treatment eventually decided us in favour of that course. On arrival at the hospital all her symptoms were exaggerated; in view of the extreme restlessness she was given morphine gr. 1/6 and hyoscine gr. 1/100 hypodermically without any effect. The morphine was repeated the next morning, but by the evening of the same day she was worse. Restlessness and delirium were marked, and auricular fibrillation was evident. A dose of quinidine was vomited, as was everything else, and her condition seemed desperate (I telephoned to Dr. Weston that evening to say I thought that she would die).

At this point I stopped all other treatment and ordered insulin (5 units) three times a day, together with frequent sweetened drinks. There had been no glycosuria, but she complained often of thirst and her mouth was parched. Within a few hours improvement was definite; she rapidly became quiet; the heart rhythm returned to normal, and after two days her condition ceased to cause any anxiety. A most striking feature was the fact that shortly after the first dose of 5 units of insulin she had some hours of natural sleep.

After reading Dr. Lawrence's paper on October 25th I felt that the dose of insulin might be increased, and 20 units were given before her midday meal; symptoms of hypoglycaemia ensued, which were relieved without difficulty by giving glucose by the mouth; the daily dose since has been 10 units, given in two equal parts. The general appearance of the patient has improved in an extraordinary way; the exophthalmos has almost entirely disappeared; the conjunctivae still have an icteric tinge, which was noticed for the first time two days after her admission; the heart rate is 120 and is regular; the thyroid is very much smaller; she eats a liberal diet and has obviously gained weight; there has been no vomiting since insulin treatment began and abdominal distress rapidly disappeared; mentally she is much calmer, but is still inclined to be emotional; she sleeps well, and sat up for an hour without ill effect on the eighth day after her admission.

My object in writing this letter is to draw attention to the fact that a very acute case of Graves's disease strikingly improved in the unsatisfactory environment of a general hospital ward, which contained one or two noisy patients, after the administration of small doses of insulin; and, further, in view of the caution of the fourth paragraph of Dr. Lawrence's summary, to point out that elaborate laboratory control was found, in this case at all events, to be superfluous.—I am, etc.,

Birmingham, Oct. 29th. A. P. Thomson.

PORPHYRINURIA.

Sir,—In his account of a case of haematoporphyria congenita, in the British Medical Journal of November 1st (p. 803), Dr. H. T. Ashby mentions the fact that most cases of porphyrinuria are the result of taking sulphonal or an allied drug for a considerable period. I should like to draw attention to veronal, one of these allied drugs, as a rare cause of porphyrinuria, hardly yet generally acknowledged.

In September, 1923, I saw a woman, aged 39½, recovering from a very painful organic illness, who for more than two months had been having 5 grains of veronal almost every night as a hypnotic. Her urine for a considerable time had been deep red or red-brown in colour, and free from haemoglobin and albumin. The colour was due to the presence of haematoporphyrin, and disappeared gradually in the course of two weeks after the discontinuance of the veronal.

For a time the patient also suffered from paresis of the lower extremities (right knee-jerk absent), with pains in the calf muscles, possibly due to "haematoporphyrinuric polyneuritis."—I am, etc.,

F. Parkes Weber, M.D., F.R.C.P.

London, W., Nov. 1st.

EPITHELIOMA OF THE SCROTUM IN COTTON-SPINNERS.

Sir,—Dr. Cochrane's letter on epithelioma of the scrotum (November 1st, p. 835) is interesting. I have frequently seen something like a papulo-vesicular eczema—or as I should rather call it a papulo-dermatitis—in the flexures of the scrotum and thigh when the two epidermic surfaces have been subjected to the influence of oil and collected perspiration for a long time.

Dr. Leitch has clearly shown that a cancerous condition can be produced by a long-continued enclosure of epithelial excretion, which I consider the most cancer-producing substance known—in fact, the only thing which does produce cancer, in my opinion, is the product of dead and decaying epithelial cells. No one has ever pointed out anything else, amongst the multitude of causes and cures which have been put forward, that can outweigh this view.

Chimney-sweeps and others are not much given to frequent ablutions, so that the scrotal flexures suffer very much from neglect, often of long duration, and the deposits in the wrinkles of the scrotum are often not disturbed for years. Now, these conditions will certainly keep up a chronic irritation of the epidermis, which will some day result in epithelioma. Dr. Cochrane has evidently caught this in the stage before malignancy has ensued, as the polymorphs described by Rolland are, in my opinion, epithelial cells in the progress of their development. This dermatitis always yields to bathing with hot water and suitable applications unless the part has become malignant. Then I would say surgical intervention is necessary.

I can see no reason why spinners and chimney-sweeps should exclusively possess this part for the expression of epithelioma. The only reason is the long neglect of conditions produced by the exposure to the exigencies of their occupation.—I am, etc.,

Bolton, Nov. 3rd. A. W. Crawford, M.B., C.M.

THE LEAGUE OF REMEMBRANCE.

Sir,—On the eve of the sixth anniversary of Armistice Day it gives us great pleasure to testify to the activities of the League of Remembrance (1914-1919).

Having now had several years of experience of the work of the League, we are in a position to form an opinion of its usefulness. It confers practical benefits to all institutions connected with the health of the nation which care to seek its assistance. This opinion is based not only on an inspection of the work carried on at the League of Remembrance, but also on our practical experience from the hospital point of view of its value in the work of the wards. Hospitals, infant welfare centres, and organizations of a similar kind have only to send materials and pattern and the League makes them up into the finished article required, without making any charge for its services.

We have personally inspected the workrooms; the specially equipped department in which the surgical dressings are made receives our warmest commendation, as also do the hygienic and aseptic principles which are exercised throughout the whole establishment. We can, moreover, testify to the promptitude, accuracy, and excellence with which the work is performed.

The League of Remembrance, a continuation of the War Hospital Supply Depot movement, is, we believe, the only institution of the kind in the world. It has proved of great service to the hospitals, and the number of appeals for help is continuously increasing. These appeals are straining its present resources to the utmost, and we strongly recommend to public inspection and support this organization, which has taken, as an integral part of its business of remembering, the relief of the sick and suffering.

All communications should be addressed to Mrs. E. H. Gibson, C.B.E., Honorary General Manager, League of Remembrance (1914-1919), 1, Marlborough Gate, London, W.2.—We are, etc.,

William Arbuthnot Lane.	Alfred J. Rice-Oxley.
Arthur Sloggett.	H. J. F. Simson.
Robert Hill.	John Murray.
James Purves-Stewart.	C. Knox-Shaw.
Alfred Fripp.	R. H. Jocelyn Swan.
Joseph Skevington.	Herbert Smale.
Robert Jones.	Leslie Paton.
Frank Colyer.	Marion Vaughan.

November, 1924.

ASSISTANTS IN GENERAL PRACTICE.

Sir,—I was very pleased to read the correspondence in the Journal on this subject. The poor remuneration received by assistants should certainly be made subject to inquiry by a responsible body, such as the British Medical Association, and a minimum should be fixed. It depends a good deal on the situation and style of practice, but assistants are shamefully underpaid and overworked. The densely populated districts, especially Stepney, Bethnal Green, and Whitechapel, are the worst offenders in this respect. I know of one instance, not a hundred miles from Whitechapel, where a male assistant is paid under £200 per annum, and only gets half a day off per week.

The pay is inadequate enough, but the hardest thing for a young assistant is to be deprived of liberty. During his student days he was used to hard work, but he had ample time for sport and social intercourse; when he enters into general practice as an assistant, then he finds that he is suddenly cut off from all these. Nominally he is a member of his Branch of the British Medical Association, but he never gets an opportunity for attending meetings of the Branch or Division. His hopes of keeping up and improving his medical knowledge by attending a hospital for a few hours a week are doomed to disappointment, simply because he has not the leisure.

The surgery hours are far too long; two and a half hours in the morning and three to three and a half at night are unnecessary. There should not be any Sunday morning surgery. On Saturday the evening surgery should be in the afternoon between 3 and 5 o'clock, instead of 6 to 9. The working men cease work at 1 p.m. on Saturdays and can well attend in the afternoon. An assistant is on duty for twenty-four hours daily. The weakness and the strength of an assistant's position is its transient nature, but that is no argument in favour of his being exploited by his more fortunate brethren.—I am, etc.,

October 19th. Fara.

CROWNER'S LAW.

Sir,—Will you permit me through the courtesy of your columns to draw attention to a matter of very grave concern to the profession at large and at the same time to expose one more case of "official" interference and ineptitude? The official concerned is one of our non-medical coroners and the circumstances of his interference as detailed.

In the course of my midwifery practice I had occasion to resort to forceps delivery on the supervention of signs of maternal and foetal distress in a primipara, aged 25. The baby was born in a state of white asphyxia at 4.30 p.m. on September 20th. After an hour's artificial respiration I succeeded in resuscitating the child, which, however, died seventeen hours later. I issued the usual death certificate of (1) obstructed labour, (2) asphyxia and convulsions (the "asphyxia" referred to "asphyxia neonatorum"), on the morning of September 22nd.

On the morning of the 24th I received an insolent letter from the coroner telling me that "the cause of death as stated by you must have convinced you that this was a case which ought to be reported to the coroner," and formally calling upon me for an explanation of my conduct before "taking steps for the disinterment of the child and the holding of an inquest." It furthermore stated that "by your action the child has been buried before registration and without the registrar's authority or mine."

Accordingly I made an appointment to interview the coroner on the same afternoon, but found on arrival that he could not see me for "probably two hours." Shades of Chesterfield! At an interview on the following morning I learnt that the underlying cause of the commotion was the fact that the baby had been buried, but that the certificate of death, which the parents had in their possession some forty-eight hours, had not been delivered to the registrar until after the burial.

I suspected that there was an attempt to place the neglect of the superintendent of the cemetery on my shoulders, and asked for a precedent for the reporting of such deaths. I failed to learn of any legal enactment whereby one was bound to report such a death. Incidentally, I pointed out that if the child had been stillborn there would have been no occasion for this display of forensic acumen.

We agreed that I should write a full report of the case and forward it to the coroner. I have never received any acknowledgement of my report—a fact which does not surprise me in view of my previous experience. I have learnt since from many of my friends in various parts of the country that they invariably deal with such cases as I have done.

Perhaps you would insert this letter as a warning to my professional brothers.—I am, etc.,

October 24th. Ne Obliviscaris.

Obituary.

HENRY CARTER MACTIER, M.B., B.Ch.,
Wolverhampton.

We have to record, with much regret, the death of Dr. H. C. Mactier on October 28th. Henry Carter Mactier was born in 1872, and was educated at Trinity College, Dublin, where he graduated M.B., B.Ch., B.A.O. in 1894. He filled the post of house-surgeon at St. Mark's Ophthalmic and Oral Hospital, Dublin, in 1894, and in the following year was house-surgeon in the Wolverhampton and Midland Counties Eye Infirmary. In 1900 he was appointed honorary surgeon to the Wolverhampton and District Hospital for Women, and assistant surgeon to the Wolverhampton Eye Infirmary in 1903, later on becoming honorary surgeon. His other appointments included those of honorary ophthalmic surgeon to the Royal Orphanage, Wolverhampton, ophthalmic surgeon to the Bilston Education Committee, honorary surgeon to the Church Mission to the Deaf and Dumb in Staffordshire, and medical referee to various insurance societies. In 1920 he was awarded the M.B.E. for services in connexion with the war. He was elected a member of the British Medical Association in 1897, and was a member of the Council from 1913 to 1921. He had been a representative of the South Staffordshire Division since 1910 and its honorary secretary since 1911. He was a member since 1912 of the Staffordshire Branch Council. He was formerly a member of the Central Ethical, Medico-Legal, and Welsh Committees, and also of the Contract Practice, Maternity and Child Welfare, and Ministry of Pensions Subcommittees. He was, in short, a fine representative of the kind of man who is always ready to undertake any kind of work for his profession, and who becomes the pivot of that kind of work in his neighbourhood. Dr. Mactier was also a member of the Midland Ophthalmological Society and had been a member of the Wolverhampton Borough Council. He was the author of various papers in medical publications, including "The dangers of cocaine," "The effects of shock on chronic glaucoma," and "The indiscriminate use of atropine in eye diseases," which appeared in the British Medical Journal. He was one of the founders of the Wolverhampton Rugby Football Club. He also played cricket, and was an original member of the Newbridge Tennis Club.

The funeral service on October 30th was attended by Dr. T. Ridley Bailey, representing the Council of the British Medical Association, and representatives of the South Staffordshire Division, the Eye Infirmary, and the Wolverhampton Insurance Committee, of which Dr. Mactier had been re-elected chairman at the last annual meeting.

It was with much regret that the announcement of the unexpected death of Dr. J. L. Rentoul was received in the North of Ireland. Dr. Rentoul had had a mild attack of encephalitis lethargica in the early part of the year, and had recovered and resumed his work, although he never quite regained his usual form. Lately severe abdominal and thoracic symptoms began to trouble him, which only very partially yielded to treatment, and it was decided to perform an exploratory laparotomy, although the great risk was manifest, to obtain relief. Unfortunately he succumbed in the attempt. John Lawrence Rentoul was a son of the Rev. James Rentoul of Dromore, co. Down. He graduated M.B.Edin. in 1900, and soon settled in Lisburn, co. Antrim, where he acquired a large practice; but his bent was always towards the scientific side of the profession. Soon after the war broke out he obtained a commission in the R.A.M.C. as temporary captain, and later was appointed bacteriologist to the hospital ship *Britannic*, and was serving on board when she was torpedoed in the Aegean Sea in 1916. He was saved, and was put in charge of a field laboratory in France, and remained in France till the war was over. When he was demobilized he settled in Belfast as a clinical bacteriologist, and rapidly gained a large connexion among the medical men and the public. Latterly he devoted much time to tuberculosis, and was testing a new serum treatment, which he was soon to put on the market; he had carried out many experiments and observations. Dr. Rentoul was a great favourite, and played a good game of golf; his reputation was extending rapidly, and his untimely loss is being deeply mourned by many, both in and out of the profession. Much sympathy is felt for his widow, and his brother, the Rev. Steele Rentoul of Glasgow.

Dr. J. Horne Wilson, who died recently, was the son of Councillor R. G. Wilson of Aberdeen, where he was born in 1876. After receiving his early education at the Grammar School and Gordon's College, he went to Marischal College, and graduated M.B., Ch.B.Aberd. in 1899 and M.D. with honours in 1903. He had served as house-physician to the Royal Hospital for Sick Children, Aberdeen, assistant to the Glasgow Maternity Hospital, and assistant physician at the Chief Tuberculin Dispensary, Chelsea. He joined the R.A.M.C. in July, 1916, served with the 37th and 20th casualty clearing stations in France, being invalided out with the rank of captain in December, 1917. On returning to civil life he was appointed as a consultant to the Ministry of Pensions, but his continued ill health led to his retirement from practice in 1922, and he returned to Aberdeen. He is survived by his widow, two sons, and a daughter.

Professor AUGUSTE BROCA died on October 2nd, a few hours before the publication of his last work, *La Tuberculose chirurgicale*. He was born in 1859, the son of the late Professor Paul Broca, founder of the modern surgery of the brain. After a distinguished medical career, during which he specialized in the surgery of children, Auguste Broca entered the French Faculty of Medicine in 1913, first as professor of operative surgery, and, later, as professor of topographical anatomy. After the war he was appointed to the chair of surgery of children and orthopaedics. Professor Broca's more important works include *La chirurgie infantile*, issued in 1914, *La chirurgie de guerre et d'après guerre*, in 1921, and his posthumous publication on surgical tuberculosis.

Dr. EUGÈNE ROCHARD, a well known Paris surgeon and member of the Académie de Médecine, has recently died, at the age of 71.

CORRECTION.—In the notice of Mr. Robinson's death published last week at page 837, the Christian name should be Edmund, not Thomas.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

AT a congregation held on October 31st the following medical degrees were conferred:

M.B., B.CH.—D. E. Cuffey, A. G. Story.
M.B.—G. K. Thornton.

UNIVERSITY OF LONDON.

SIR CUTHBERT WALLACE, K.C.M.G., C.B., has been elected Dean of the Faculty of Medicine.

Three lectures on the history of medicine will be delivered by Dr. Charles Singer at University College Hospital Medical School on Thursdays, November 20th, 27th, and December 4th, at 4.15 p.m. The first lecture will deal with recent light on the origin of syphilis, the second with the beginning of anatomical study, and the third with the scientific work of Robert Koch. The lectures are open to all medical students.

UNIVERSITY OF DURHAM.

AT a convocation held on October 29th the following medical degrees were conferred:

M.D. (Practitioners).—Ralph E. Drake-Brockman.
M.B., B.S.—F. W. Marshall.

UNIVERSITY OF DUBLIN.

THE Board of Trinity College has appointed Mr. James Edmond Hegan to be Lecturer in Dental Surgery and Pathology in the School of Physic, Dublin University, in the place of the late Dr. Arthur W. W. Baker.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

AN ordinary quarterly comitia of the Royal College of Physicians of London was held on October 30th, the chair being taken by the President, Sir Humphry Rolleston.

Membership.

The following were admitted to the Membership, having passed the required examination:

Stanley Batchelor, *M.C.*, M.D.Lond., L.R.C.P., Davis Evan Bedford, M.B.Lond., L.R.C.P., Jyotish Chandra De, M.B.Calcutta, L.R.C.P., William Devereux Forrest, M.B.Durh., L.R.C.P., Malcolm Kennedy Gray, M.B.New Zealand, Anis Salama, L.R.C.P., Kenneth James Langlands Scott, M.D.New Zealand, Terence Watson Turner, L.R.C.P.

Licences.

Licences to practise Physic were granted to the following 245 candidates, who had passed the necessary examinations and had conformed to the by-laws and regulations:

C. H. Ackroyd, F. N. Adams, *Iris I. G. Adams, C. Adamson, B. Adlington, G. L. Alexander, A. J. Amor, S. M. Anderson, T. F. Anderson, L. V. Angel, H. Aukland, *Georgette Bachrach, J. M. Bailey, H. C. J. Ball, G. W. Bamber, L. J. Barford, *Alison E. M. Barnaby, C. F. J. Baron, R. McG. Barron, S. A. Beards, L. F. Beccle, A. E. Beith, P. C. Bennison, S. Berman, E. H. J. Berry, A. G. Bewes, H. E. Blake, R. H. Boggon, A. J. S. L. Boyd, W. H. Bradfield, J. H. Broadhead, G. C. W. Brown, E. Buchler, G. H. Buncombe, N. F. C. Burgess, M. Byala, A. Canard, T. E. Cawthorne, P. F. Chandler, W. T. R. Chapman, F. W. Charman, K. R. Chaudhri, W. J. B. Chidlow, *Florence C. Churcher, S. Cieman, T. A. Clarke, E. E. Claxton, I. Cohen, W. R. F. Collis, W. S. C. Copeman, J. W. E. Cory, A. B. Cowley, B. W. Cross, R. Crosthwaite, W. I. Daggett, A. A. Dalby, A. F. C. Davey, D. Davies, D. J. Davies, E. W. P. Davies, Kathleen Davies, L. F. Davies, F. M. Deighton, G. W. S. de Jersey, P. H. Diemer, J. M. Dobie, W. A. Drake, C. S. Drawmer, J. Dreadon, W. A. D. Drummond, G. D. Drury, H. A. Dunlop, J. D. Durance, S. F. Durrans, D. F. Durward, H. C. Edmunds, J. T. R. Edwards, *Josephine O. Ellen, J. B. Elkison, *Marguerite Elman, H. G. English, A. J. Enzer, J. A. Evans, J. P. Evans, *Sarah Evans, W. Evans, W. G. Evans, N. J. Everard, S. Abd-El-Malek Fam, W. J. C. Fenton, F. E. Fox, D. Frost, G. A. Fulton, J. H. Gaddum, H. C. Gage, J. A. Galletly, J. Gaughan, M. Geaney, N. T. Glynn, S. Goldstein, *Minnie Gosden, B. Green, F. G. Greenwood, *Elsie C. Griffin, H. F. Griffiths, J. I. Griffiths, J. F. Hamber, A. C. Hampson, C. L. Harding, H. E. Hargreaves, *Iris M. Harmer, W. E. Heath, *Margaret R. Herford, W. A. Hervey, A. H. Heyworth, F. Hoffstein, J. G. Hume, W. E. Hunter, D. S. Huskisson, H. V. Ingram, *Adèle H. Jacob, H. N. James, *Beatrice Jervis-White-Jervis, H. A. Johnson, R. S. Johnson, I. L. Johnstone, *Enid M. Jones, F. M. L. Jones, J. D. Jones, R. D. Jones, R. M. Jones, *Doris E. Joscelyne, W. E. Joseph, H. Joules, C. J. Jowett, R. P. S. Kolman, C. E. Kilmister, A. J. King, G. King, J. F. L. King, F. H. K. Knight, *Marjorie E. Knowles, *Nancy T. Lancaster, R. L. Lancaster, S. W. Lane, *Mary K. Lawlor, C. H. Lee, *Nora Leesmith, J. Leitch, T. C. Lewis, E. I. Liberman, K. S. Lim, D. T. Lloyd, E. O. Lloyd, W. E. Lock, G. K. Loveday, M. F. B. Lynch, L. H. Macdonald, H. B. Macevoy, D. M. Mackay, R. R. Mackenzie, H. Macmachlan, R. B. McVicker, J. L. B. Marais, G. R. Marcano, D. P. Marks, F. Marsh, F. Martyn, *Gertrude M. Mayhall, J. D. Mills, F. G. Mogg, *Frances C. Nicklin, C. T. Norris, T. J. O'Donnell, G. C. B. Oliver, L. E. Owen, W. B. Owen, M. Y. Paget, T. B. Pahlajani, A. E. G. Parry, *Sybil de Haut Rey Pattison, Milroy A. Paul, C. E. Pearson, *Annie Pichaimuthu, P. J. J. Pienaar, J. E. Piercy, B. Pollard, F. D. S. Poole, *Beatrice M. Powell, C. V. Powell, L. N. Pyrah, *Violet A. Quilley, S. Rachmantzik, F. C. Read, S. F. Reynolds, W. Richards, D. Riley, W. G. Roberts, C. H. H. Robertson, A. B. Robinson, W. F. Rowe, *Annie E. G. Rowlands, C. Sabhapati, J. H. Saint, F. R. Sandford, H. B. Savage, F. W. Schofield, C. M. Scott, W. G. Sears, J. Sévi, H. R. Shone, J. H. Simpkiss, D. A. Skan, H. Smith, R. F. Smith, L. Spira, *Betty Stainer, R. Stanford, L. Statnigrosch, H. H. Steadman, J. Stein, J. A. F. Storrs, *Grace M. L. Summerhayes, A. Swain, *Victoria W. Symonds, R. C. Tatham, E. W. P. Thomas, G. W. R. Thomson, C. H. C. Touissant, H. Treissman, *Bertha Turner, J. H. M. Walker, J. Wallman, S. E. Walmsley, E. J. Warburton, C. A. Wells, B. G. Wheatley, H. D. E. Whitman, C. H. Wight, G. Wignarsja, E. R. P. Williams, H. K. Williams, F. A. Wilson, *Ellen E. Wirtz.

* Under the Medical Act, 1876.

An alteration in By-law 194 was proposed permitting the election of women as Fellows of the College. This was passed for the first time. It will require to pass a second time at a subsequent comitia before becoming operative.

Dr. W. S. A. Griffith drew attention to a paragraph in the SUPPLEMENT to the BRITISH MEDICAL JOURNAL of October 4th, 1924, relating to an instruction by the American immigration authorities that persons who desire to emigrate from this country to the United States must be examined by medical practitioners who are members of the British Medical Association. After some discussion, in which Dr. R. A. Bolam who was present, joined, a resolution was passed drawing the attention of the President of the General Medical Council to the injury the proposed arrangement would inflict on medical practitioners in this country who are not members of the Association, and who would be precluded from giving medical certificates even to intending immigrants who were their own patients.

A report was received from Dr. Drewitt concerning the Chelsea Physic Garden. It was directed that this should be entered on the minutes.

The President announced the award by the Royal College of Surgeons of the Jenks Scholarship for 1924 to Mr. Antony R. C. Higham.

A report was received from the Committee of Management in regard to the institutions recognized for the courses of instruction for the several special diplomas.

Sir William Hale-White was reappointed a member of the Committee of Management. Books and other gifts presented to the library during the past quarter were received and the thanks of the College were returned to the donors. After some formal College business had been transacted, the President dissolved the comitia.

CORRECTION.—The announcement published last week (p. 838) of Mr. Michael G. O'Malley's appointment as Professor of Surgery should read University College, Galway, and not Cork, as printed; Professor C. Yelverton Pearson still holds the Professorship of Surgery at University College, Cork.

The Services.

TERRITORIAL DECORATION.

THE Territorial Decoration has been conferred upon the following officers of the R.A.M.C.(T.A.): Majors F. W. B. Young, A. Walker, D.S.O., and G. B. Gill, and Captain E. B. Keen.

14TH STATIONARY HOSPITAL DINNER.

THE fifth annual dinner of the medical officers of No. 14 Stationary Hospital will be held on Friday, December 12th, at the Trocadero Restaurant, Piccadilly, at 7.15 for 7.45 p.m. Lieut.-Colonel J. R. Harper, C.B.E., will be in the chair. The price of the dinner is 15s., exclusive of wines. Evening dress or dinner jacket will be worn; miniature medals optional. The honorary secretaries are Lieut.-Colonel H. M. Perry and Dr. H. L. Tidy, 39, Devonshire Place, W.1.

V.A.D. TRAINING IN MILITARY HOSPITALS.

THE War Office announces that arrangements have been made for a short course of annual training in military hospitals for a limited number of Voluntary Aid Detachment nursing members. Instructions as to joining will be issued in each case from the War Office. No pay will be issuable for the period of training, but those attending the course will have board and washing allowance at the rate applicable to members of Queen Alexandra's Imperial Military Nursing Service.

Medico-Legal.

REX *v.* HADWEN.

MANSLAUGHTER CHARGE AT GLOUCESTER ASSIZES.

THE trial of Dr. W. R. Hadwen of Gloucester, on an indictment for manslaughter arising out of the death of a child whom he had attended, took place at Gloucester Assizes on October 27th, 28th, and 29th before Mr. Justice Lush. The counsel in the case were Mr. C. F. Vachell, K.C., and Mr. StJohn G. Micklethwait, on behalf of the Director of Public Prosecutions, and Sir E. Marshall-Hall, K.C., and Mr. A. F. Clements for the defence. Dr. Hadwen pleaded "Not guilty."

Case for the Prosecution.

Mr. VACHELL, in opening the case, said that Nellie Burnham, aged 10, died on August 10th last from diphtheria and pneumonia which followed it. She was attended in her illness by Dr. Hadwen, who, the prosecution alleged, failed, through gross inattention and lack of skill or knowledge, or both, to detect the disease from which the child was suffering and to administer the proper remedy. Counsel then described the common symptoms of diphtheria and the general procedure of the medical profession in such cases, more particularly the taking of a swab from the patient's throat and the administration of antitoxin. He went on to review at length the circumstances of the case, and said that, in spite of the highly suspicious symptoms, Dr. Hadwen never took a swab from the throat or administered antitoxin. A fact to which, he understood, the defence attached importance was that two days before her death, while the mother was away from home, the child left her bed and went barefooted downstairs into the scullery to get a drink of water, but the evidence to be called with regard to the *post-mortem* examination would show that the pneumonia was of the type which followed diphtheria, and not of the type which followed a chill.

Mrs. BURNHAM said that her daughter was taken ill on July 30th, and Dr. Hadwen, her club doctor, was called in on August 1st. He remarked that the case looked like scarlet fever. He put two fingers in the girl's mouth and examined her throat, and examined her back and chest for any rash. He prescribed a gargle of vinegar and water. His examination occupied only three minutes. The breath was very offensive, and there was a yellowish discharge, tinged with blood, from the nose. She mentioned the foulness of the breath to the doctor on his second visit on August 4th, when he looked down the child's throat, using his finger as before, but did not feel her pulse or take her temperature. He came next on August 6th, by which time she was weaker and the breath more offensive. By this time the nose had a yellowish, spongy appearance like the throat. The doctor's next visit was on August 9th, when, the child being weaker, she sent for him. He looked down the throat, felt the pulse, and sounded the chest, but did not take the temperature. He said that the throat was clearing nicely. He stayed about five minutes. At the previous visit he had prescribed a tonic. He did not take a swab at any time. The child vomited first on August 8th. On the evening of August 9th, the child being evidently worse, there was a family consultation, and Dr. Ellis was summoned. He took a swab of the throat, and examined the child's chest and back, but she was then in a very grave state, and died on the early morning of the 10th.

In cross-examination certain discrepancies in the evidence given by the witness compared with the evidence she gave at the coroner's court were pointed out; these related to the date on which she first suspected the case to be one of diphtheria. In reply to further questions, she said that she sent for Dr. Ellis on the recommendation of her brother-in-law. She knew nothing of an acrimonious dispute between Dr. Ellis and Dr. Hadwen in the public press. She did not tell Dr. Ellis that Dr. Hadwen had seen the child earlier that day, but he was informed that Dr. Hadwen had been attending the case and was told what Dr. Hadwen had done. Dr. Ellis was willing to give a death certificate, but she did not wish for one, because, being dissatisfied with Dr. Hadwen's treatment, she wanted to have an inquest. It had not occurred to her that it was not quite fair to Dr. Hadwen not to tell him that the child was dead, so that he might be present at the *post-mortem* examination. She admitted that it was a rule of her society that in an emergency patients might send for the doctor at any time, and that she did not send for Dr. Hadwen after his visit on the 6th until the morning of the 9th, but she thought "it was his place to come without being sent for every time." His lordship asked whether, when the doctor came two days after the child had been downstairs, she told him of that incident; the witness replied that she did not. Re-examined, she said that when Dr. Ellis was called in, three hours before the child died, it was the first time she had ever seen him. He stayed two hours; he showed no ill feeling towards Dr. Hadwen, and said nothing about Dr. Hadwen's treatment.

Other witnesses—members of the family and neighbours—were called and gave similar evidence. A brother-in-law of Mrs. Burnham said that, late on the evening before the child's death, he, as a result of a family council, telephoned Dr. Hadwen to the effect that they were not satisfied with his treatment and had decided to call in another doctor. Dr. Hadwen replied that he had done his best. Dr. Ellis had been the witness's own doctor.

Dr. E. S. ELLIS said that when called to attend the child he found her seriously ill, with a temperature of 102.5° and a pulse rate of 154. Her general condition was toxaemic. When he came he was told that it was probably a case of diphtheria. He noticed her very rapid breathing, and at once thought of pneumonia. He found the right lung solid and the left bronchitic. In the throat he found membrane right across from tonsil to tonsil. There was a discharge from one nostril—a greenish dirty discharge, just tinged with blood. He took a swab, and then he wondered whether there might not be fluid in the chest, but on exploration found no fluid. In his opinion the child was suffering from diphtheria and pneumonia. He had no doubt whatever as to the diphtheria, even before the result of the examination of the swab was available, and he notified it at once; there was such obvious diphtheritic membrane. He did not administer antitoxin because it was too late, the child was dying.

In the course of a long cross-examination by Sir E. Marshall-Hall, Dr. Ellis expressed the opinion that the diphtheria spread down into the lung; it was really all one disease. The pneumonia in this case was unilateral according to the *post-mortem* findings.

Have you ever known a case of pneumonia, the sequel of diphtheria, which has been unilateral?

Witness: No, nor bilateral either.

Must it not be one or the other?

Witness: I have never come across a case before—the cases go to the hospital. It is a question for the pathologist.

Was the pneumonia in this case lobar or lobular?

Witness: When I auscultated that chest it was so late the whole thing was solid; it might have been either.

At a later stage in cross-examination counsel asked the witness whether, in August, 1923, he wrote to the editors of two London daily papers inviting them to send representatives to interview him with reference to Dr. Hadwen, and whether in the course of his communication, which was not printed, he made a violent attack on Dr. Hadwen and his professional status? Dr. Ellis said there was certainly some communication, and he had pointed out a discrepancy between Dr. Hadwen's qualifications as given in the *Medical Register* and in a book printed locally. There had been a very acrimonious correspondence in the local press between himself and Dr. Hadwen over the vaccination question. Later he was asked for information by the London newspapers and a reporter called upon him. Dr. Hadwen had been communicating to the public press matter derogatory to the witness and everybody else in the profession: he suggested that the epidemic at Gloucester was not small-pox but chicken-pox, and that the whole epidemic had been trumped up for the benefit of the doctors.

Re-examined by Mr. Vachell, Dr. Ellis said that the epidemic in Gloucester was of small-pox, with a certain amount of chicken-pox. Dr. Hadwen wrote a letter, inserting it as an advertisement in the local press, dealing with this subject from the antivaccination point of view. The witness entered into some private correspondence with Dr. Hadwen on the matter, and was afterwards asked by three reporters for some information. At about the time this case arose there were some overtures with a view to making up the differences between the medical men in Gloucester.

Dr. W. WASHBOURN, city bacteriologist, who made the *post-mortem* examination, described his findings. The back of the throat, tonsils, soft palate, and larynx were intensely inflamed, almost black in one or two places. An adherent patch of membrane at the back of the epiglottis was characteristic of diphtheria. Both bronchial tubes were congested. The right lung was solid throughout from inflammation. The right bronchial tubes were filled with dense membrane, some of which was adherent and had evidently been formed *in situ*. At the top of the bronchus was a piece of loose diphtheritic membrane, measuring about three inches by one inch. In the pleural cavity there was a small quantity of fluid—about three ounces. He could give an opinion with confidence as to the cause of death: it was due to diphtheria and pneumonia. He found the diphtheria bacillus present in the swab received on the day of the girl's death. He received other swabs a day or two later from the medical officer of the isolation hospital. He learned afterwards that these were taken from members of the family of the dead girl, and a playmate. Two were negative, and two positive.

In cross-examination the witness expressed the opinion that the condition of the right lung was that of lobar pneumonia of recent date—not more than two or three days old. When he examined the swab he was not aware that the child from whom it had been taken was dead. Although the Klebs-Loeffler bacillus was recognized by the great majority of the profession to be the specific bacillus of diphtheria, it could be found also in some cases where there was no diphtheria. He was aware, just before starting the *post-mortem* examination, that the child had been Dr. Hadwen's patient, and that there was some charge of negligence against Dr. Hadwen in his treatment of the case. Dr. Bell, deputy-coroner (then acting-coroner), was present at the examination, not at his invitation but as a right, and he (witness) asked him whether Dr. Hadwen was going to be present. He thought the deputy-coroner answered that Dr. Hadwen had not been invited or that he was not coming. After replying to further questions, mainly about the symptoms of diphtheria and pneumonia, the witness said that the membrane he found *post mortem* was undoubtedly diphtheritic, but he did not examine it microscopically; he thought it so clear that it was not necessary to examine further. Later the witness said that in this case, so far as he could judge, the heart was healthy. In a great many cases, but by no means in all, fatty degeneration would accompany acute diphtheria. The duration of the pneumonia found *post mortem* would fit in—although a "tight fit"—with the theory that the pneumonia was set up when the girl, two nights before her death, got out of bed and went downstairs. He did not think pneumonia caused by such a chill would have begun to manifest itself until from twelve to twenty-four hours afterwards, but it was impossible to eliminate the circumstance as a cause of the pneumonia. Nevertheless, he

felt sure that the diphtheria was a very large determining factor in the death of the child; the right bronchial tubes were so extensively involved in membrane that this would have been likely to set up right-sided pneumonia.

Dr. R. B. BERRY, M.O.H. for Gloucester and medical superintendent of the city isolation hospital, described the proper course to take when a doctor found the familiar symptoms of diphtheria present. He spoke of members of the Burnham family who had been admitted to the isolation hospital during August suffering from diphtheria. In cross-examination he admitted that antitoxin treatment was not always successful. He considered the pneumonia in this case was secondary to the diphtheria. The child died from diphtheria progressing through pneumonia to death.

Dr. E. GRAHAM of Gloucester said that he attended, as her panel doctor, an elder sister of Nellie Burnham on the day after the girl's death. He took a swab of the throat and sent it to the medical officer of health. In cross-examination he acknowledged himself a strong opponent of Dr. Hadwen.

Sir WILLIAM WILLCOX, in reply to Mr. Vachell, gave a description of diphtheria, its origin, and symptoms. Vomiting might occur at the onset, and again at a later stage when the disease became dangerous; it was a grave sign after the first or second day. He outlined the prudent course for a medical man to take on finding a patient suffering from sore throat, thickness of utterance, offensive breath, coloured discharge from the nose, and drowsiness. A swab should be taken, and if there was to the naked eye a reasonable suspicion of diphtheria, as evidenced by visible membrane or patches of exudation in the throat, then it would be his duty to give antitoxin without waiting for the result of bacteriological examination. Diphtheria antitoxin had reduced the mortality from diphtheria from 30 or 40 per cent. down to 10 per cent. and under. In 1893—two years before the antitoxin treatment was first used in this country—the mortality from diphtheria was 389 per million in England and Wales; the figure in 1923 was 71 per million. In his judgement the cause of this child's death was diphtheria and pneumonia. Hearing the evidence he had no doubt the pneumonia was secondary to the diphtheria. It was uncommon for this kind of pneumonia to be unilateral, but he had seen it occur in diphtheria. It was very difficult to say whether this was lobar or lobular, but in view of the condition of the right bronchial tubes he thought this was a massive or very extensive bronchopneumonia. In his opinion the child's journey downstairs would not cause the pneumonia such as was found in this case; though it would, of course, be harmful at that stage of the disease and would subject the child to grave risk of heart failure. In further evidence the witness said that Dr. Ellis did quite the right thing in using the exploratory needle two hours before death. It was difficult in children from clinical examination to be certain whether there was solid lung or fluid. The risk in using the needle was infinitesimal. In diphtheria the only treatment of any value was antitoxin treatment with general hygienic care. Supposing the pneumonia was independent of the diphtheria, the fact that the child was already suffering from neglected diphtheria would greatly diminish the resistance to the pneumonia, however caused.

Sir William Willcox, in cross-examination, said he saw quite a number of early cases of diphtheria in his hospital practice. A long argument then ensued on the figures in the Registrar-General's returns, which, counsel contended, did not bear out the statement that diphtheria was now a less deadly disease than formerly. Witness explained the meaning of the categories and the significance of the figures under each head, and repeated that there had been a steady decline in the death rate from this disease; in 1895 it was 313 per million of the population, and now it was 71. Counsel next referred to statistics for 1922, which showed that 2,021 cases wrongly diagnosed as diphtheria had been admitted to the Metropolitan Asylums Board's hospitals, and of these patients 77 had died. Witness pointed out that these figures were for the London fever hospitals, that the poorer districts of London were much overcrowded, and that there was a tendency for practitioners to send cases to hospital when at all suspicious of diphtheria, without waiting for the result of a swab, lest other inmates of the crowded dwelling became infected. These "wrong diagnoses" were cases of bad throats in which diphtheria was suspected but the bacteriological examination proved negative. If these "mistakes" were not made the amount of diphtheria in London would be much greater. Counsel next quoted from Sir George Newman's report for 1921, in which he referred to the increase in the figures for diphtheria due to the notification as diphtheria of cases of mild illness which seldom presented any definite clinical evidence and would not be regarded as cases of this disease apart from the fact of contact or the receipt of a positive report on throat swabs. Witness said that this was true; some doctors were over-cautious and notified diphtheria when the signs were by no means conclusive. Counsel asked why the same argument should not apply to the Registrar-General's returns. Witness pointed out that these returns were based simply on the death certificates. He was next cross-examined on Dr. Washbourn's account of the *post-mortem* findings. In reply to the judge, he gave a brief account of the nature and preparation of antitoxins and vaccines, and was questioned as to a doctor's duty if he went counter to the opinion of the vast majority of his profession. At the close of these questions his lordship, addressing Sir E. Marshall-Hall, said:

> You are faced with this difficulty, Sir Edward, that a person may hold a bona fide belief in some remedy without calling in a doctor at all, but the courts have held that an honest belief that doctors do no good, and that prayers alone have efficacy, does not dispose of a charge of wilful neglect for not calling in a doctor. The Legislature compels a parent to call in a doctor to his child.
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> Counsel: But no Legislature has yet compelled a doctor to inoculate with antidiphtheritic serum.
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> His Lordship: No; but the difficulty still remains which I have pointed out.

Counsel next produced a work on differential diagnosis, and asked whether, in view of the diagrams in that book, the diagnosis between follicular tonsillitis and diphtheria might be very difficult. Witness said that it might be impossible unless a swab was taken. Asked whether there was not real danger in inoculation owing to anaphylaxis, he replied that there might be a danger if the patient had previously been inoculated with serum, but he had never seen any fatal case through the use of antidiphtheritic serum. If a patient had had serum previously the second dose was given with special precautions. After further questions by counsel for the defence, and a short re-examination by Mr. Vachell, his lordship asked Sir William Willcox a number of questions about the efficacy of diphtheria antitoxin generally, and its efficacy when given early or late in the disease.

Case for the Defence.

Dr. Hadwen, giving evidence in his own behalf, stated his qualifications — M.D.St. Andrews, L.R.C.P.Lond., M.R.C.S.Eng., L.M.S.S.A. He said he had practised for over thirty years. He had had a fair amount of experience of diphtheria, and about twenty-five years ago was practising in Bristol when an epidemic of diphtheria occurred, and most of the cases came under his care. He had never administered antitoxin, and all his cases had been successful. Dr. Hadwen then described his treatment of the dead child's brother Leonard, who was suffering from septic tonsillitis. He suspected diphtheria in Leonard's case, and satisfied himself absolutely that no diphtheria was there. He next attended another child of the same family, who had the affection in a lighter degree. When called first to Nellie, she had been ill for two days. He examined the throat and found three ulcerative spots on the right tonsil, two on the left; the throat was red. He found no rash, but there was a watery discharge from the nose. He found a little harsh breathing in the chest, pointing to slight bronchial catarrh. He ordered an expectorant mixture and a gargle of vinegar and hot water, and gave a few general directions. He felt the child's pulse as a matter of course on every visit. The pulse was quicker than normal, and the temperature 100°. His visit lasted roughly ten minutes. The child was a poorly nourished, ill-conditioned girl. He saw no yellow, blood-streaked discharge, nor detected any offensive breath, and the mother never said a word to him about such things. At his visits on August 4th and 6th the throat was better, the bronchial catarrh had cleared up, and the child was much better. He intended to go again on the 8th, but was too busy; he was on his way there on the 9th when he was sent for. He was thunderstruck at the change in the child, and saw at once that her condition was serious. The throat had cleared up nicely, there was not a vestige of ulceration on the tonsil, there was no membrane either upon the uvula or soft palate. The breath sounds were deficient, temperature 101°, pulse 120, and he concluded pneumonia. The mother never told him that the child had been downstairs. He intended to call again that night, but was informed by telephone that the family had called in another doctor. He heard of the child's death about an hour before the inquest was held. He had no notice of the *post-mortem* examination. He reaffirmed his opinion that the child had been suffering from ulcerative or septic tonsillitis, and that she developed fatal lobar pneumonia.

In cross-examination by Mr. Vachell, Dr. Hadwen said that he doubted whether during the last three years he had had any cases of diphtheria at all. To administer antitoxin was against his views and his conscience: he considered it a very dangerous remedy. All these inoculations were based upon experiments on animals; he objected to them on that ground, but he objected to the antitoxin independently as a medical man. He was taken by counsel through the usual symptoms of diphtheria and their relative importance, and questioned by the judge on antitoxin. A long discussion then ensued between his lordship, counsel, and witness on the Registrar-General's statistics. Dr. Hadwen went on to say that he believed the bacillus to be the result of the disease, not its cause, and he saw no sense in taking a swab. He discarded the whole germ theory of disease. Asked by the judge what was his theory of the communication of disease, he spoke of a chemical poison in the atmosphere. The specific cause could not be discovered, but insanitary conditions affecting the atmosphere produced the disease. Asked what would have been his treatment had he found diphtheria, he said he would have put hot fomentations around the throat, painted the tonsils with glycerin three or four times a day, and cautioned the mother to keep the child in a recumbent position. He would, of course, have notified the case, and in the circumstances would have advised the child's removal to the isolation hospital. He contested Dr. Washbourn's opinion that the membrane he found was diphtheritic.

In re-examination by his counsel, Dr. Hadwen returned to the question of statistics. He said that with the introduction of antitoxin, diphtheria, instead of being diagnosed in the old-fashioned way, became diagnosed by a very different method, with the result that a great many common sore throats, which would have got well in any circumstances, were called diphtheria, and this led to an apparent decrease of case mortality.

Speeches of Counsel.

Mr. VACHELL then addressed the jury at some length, recapitulating the evidence which had been offered on behalf of the prosecution. He made a strong point of the fact that no medical evidence other than Dr. Hadwen's had been called by the defence. Sir E. MARSHALL-HALL followed with a speech of much greater length for the defence. He strongly attacked the credibility of one of the witnesses who had altered her evidence as to what she saw of the sick child; she had said one thing in the earlier proceedings and quite a different thing in the present trial after having in the meantime heard the medical evidence. He also described

it as most unfortunate that the second doctor called in by the family in this case was one who had been a most bitter opponent of Dr. Hadwen in the press. Dr. Ellis never communicated the fact of the child's death to Dr. Hadwen, and, what was still worse, the deputy-coroner (Dr. Bell) gave no notice of the *post-mortem* examination to the man against whom, on the result of the examination, it was intended to prefer a charge. Counsel hoped it would not be inferred that Dr. Hadwen was the only medical man in England opposed to the administration of antitoxin. He could not afford to keep eminent specialists at the court for three or four days.

The Judge's Summing-up.

Mr. Justice Lush, at the opening of his charge to the jury, said that the case was a serious one, with consequences to others than the immediate defendant.

> It is a matter of great importance also to the public, and, I may say, to the medical profession, because while, on the one hand, persons are entitled to be, and must be, protected against criminal neglect or criminal misconduct on the part of a medical man, it would be deplorable—disastrous—if a medical man, following his profession according to the best of his judgement and acting honestly in the treatment of his patient, were to have hanging over his head a fear that if anything went wrong with his patient there might be a prosecution such as this.

It was a case also which called for strong and clear proof on the part of the Crown. The jury was not sitting merely to criticize Dr. Hadwen's views. It was not a case merely of saying whether he had or had not adopted views which a wise medical man should have adopted. The charge against him was that he "did feloniously kill" the child, and it was necessary for the Crown to establish, not only that he neglected her, but that his neglect did actually cause her death. Many cases had been tried in which a medical man, qualified or unqualified, had, in endeavouring to cure his patient, chosen to administer a dangerous drug or perform some operation, and if the drug was administered or the operation performed in a disgraceful and careless fashion, or with a disgraceful ignorance as to what the effect of the drug would be or as to the way in which the operation should have been performed, and the patient died, there was no difficulty in saying that the doctor or operator caused the death of the patient. What was said in this case was very different. It was that Dr. Hadwen was so neglectful in his diagnosis and treatment that the child, whose life would have been saved if proper care had been taken, died through that neglect.

> If a doctor is culpably negligent in his treatment of a patient, and the patient dies, it is not enough for the Crown, in supporting an indictment of manslaughter, to prove that if the doctor had been careful the patient would have had a chance of getting successfully through the illness; the Crown must prove more than that, they must prove that in all human probability if care had been used the child would have recovered. If the Crown have established to your reasonable satisfaction, first that the doctor did neglect the child, and secondly that in all human probability the child would have recovered if he had not neglected her, then, and then only, you will bring in a verdict of "guilty."

His lordship considered that August 1st—the date on which Dr. Hadwen first saw the patient—was the important date in the case. The doctor had already attended the child's brother for a similar illness, and the boy had recovered. When he was called to see the child who subsequently died he found her not as bad as her brother had been, and although he had called on the brother every day he did not call on the girl again until after three days. Did the child on that first visit show such signs as would make an ordinary doctor suspect diphtheria, or did she only show the signs of sore throat? Sir William Willcox had stated that unless antitoxin was given within six days from the commencement of the illness it was practically useless, and if Dr. Hadwen had no reason on his first visit to suspect anything seriously wrong with the child's throat, the child having already been ill for two days, any neglect of the child from the second visit onwards would not make the withholding of the antitoxin a matter of very serious importance. The Crown had to prove to the reasonable satisfaction of the jury that on the first visit the child showed signs of a serious malady which the doctor refused to consider.

Next came the question of the pneumonia. If the pneumonia was really a sequel of diphtheria, then, supposing the doctor to be responsible for the diphtheritic condition, he was equally responsible for the pneumonic. But if the pneumonia was brought about by an unfortunate act on the part of the child—going downstairs with bare feet on the tiled floor—which set up a chill, and the pneumonia caused her death, no one could say that neglect on the part of the doctor in the early days of the case had anything to do with causing the death of the child.

> I come now to this question of neglect. The law does not say that if a doctor is unfortunate enough to commit an error of judgement and the patient dies he is guilty of manslaughter. The law does not cast upon anybody who is merely careless, and whose carelessness is the cause of the death of another, the responsibility of defending himself in the dock on this charge. . . . Unless the negligence of which a person is guilty is of so gross a character as to make one say of it that it is wicked negligence—not a careless, but a wickedly careless thing to have done—the person concerned cannot be convicted of manslaughter. There must be something evil in the negligence, something culpable, something criminal, before an indictment of manslaughter can be established. You have got to ask yourselves, not whether Dr. Hadwen failed to exercise that care which a doctor or anybody else ought to exercise, but whether he was guilty of what I have called culpable and wicked negligence. If he was, then the Crown have proved the first of the two things they have to prove; if he was not, the Crown have failed to prove even the first step.

His lordship then reviewed the evidence of the mother and her friends, reminding the jury that the mother's evidence as to the bad condition of the child on the first visit was uncorroborated. One could make all allowances for the mother, but she had not behaved in all respects quite in the way one would have expected her to behave. She never told the doctor the very important circumstance of the child's visit to the kitchen, and the jury might come to the conclusion that the mother's evidence was exaggerated as to the condition of the child on August 1st. If the condition of the child was as Dr. Hadwen said it was, his lordship could not conceive any ground for considering him guilty of criminal negligence in not taking a swab. He next dealt with the evidence relating to the second and subsequent visits of the doctor, and pointed out how the stories of the relatives and of the doctor conflicted.

Coming to the medical evidence, his lordship said that if the child never had diphtheria then away went the case for the prosecution. The child undoubtedly had pneumonia; if there was no diphtheria to cause the pneumonia it was probably caused by the chill. It did not follow that if it was proved that the child had diphtheria the doctor was criminally neglectful, but here came the singular aspect of the case. Dr. Hadwen's views and mental attitude were different from those general in his profession. The jury was not a tribunal to criticize his views.

> But I think it is legitimate to say that it would be very unfortunate if any doctor were to close his eyes to the improvements in medical treatment which were accepted by the great majority of his profession, and to say, "I prefer the old-fashioned treatment; I do not believe in these others." After all, medical science is a very great science, and the medical profession a very great profession, and unless a doctor is going to avail himself of the discoveries made from time to time one is not likely to see that development of medical science which one hopes to see. It does not follow from that, of course, that a man who will stick to his own views is guilty of culpable and wicked neglect. A doctor, if properly qualified, is allowed by law to follow and practise his profession in the way he accepts, and if a doctor does hold peculiar views—honestly holds them—and works them out and follows them, one cannot say that there is any culpable and wicked neglect, even though he is terribly and seriously mistaken. But a doctor or anybody else—it is not for me to pass judgement on Dr. Hadwen—may get his mind into such a state of prejudice and allow his judgement to be so blinded that really his position comes to this, that he would rather sacrifice his patient than sacrifice his prejudice. I do not say that is true of Dr. Hadwen at all. . . . But there comes a stage when a man must be judged by what he does.

Was the child (continued his lordship) suffering from diphtheria? The prosecution had got a very powerful body of evidence bearing on that question—the positive result of the swab, the coming away of the membrane, the positive results found in the two other children. Curiously enough, however, there was a very strong difference of opinion between Sir William Willcox and Dr. Washbourn. Dr. Washbourn's opinion—though it was only natural that, in deference to Sir William Willcox's views, he should not hold it quite so strongly as at first—was that the pneumonia which caused the death was lobar pneumonia, and that would be an indication, not of a secondary pneumonia brought on by diphtheria, but of a pneumonia caused by a chill. Sir William Willcox took the opposite view, and stated that the pneumonia must have been lobular and a sequel of diphtheria. It was for the Crown to prove that there was no reasonable doubt, and if the doubt still remained he would warn the jury that they must be very careful before they convicted the defendant of manslaughter. The neglect alleged against him was not in allowing the pneumonia to supervene, but in not discovering that there was diphtheria and taking proper steps. His lordship added:

> I cannot help saying that I agree with Sir E. Marshall-Hall that in a case like this, when this step, not often taken, of bringing a charge against a practising doctor in respect to his treatment of a case was in contemplation, it is unfortunate that he was not allowed an opportunity of being present at that *post-mortem* examination in order that he might see for himself what was shown to elucidate the case. He was not there. The microscopical examination of the membrane might have assisted him for aught one knows. It is an unfortunate incident. I do not advise you to attach too much importance to it, but I do not think it right to pass it over without expressing my agreement with Sir E. Marshall-Hall's statement.

Verdict.

The jury deliberated for twenty minutes. On their return the foreman announced that they had agreed upon a verdict of *Not guilty*, an announcement which was received with loud applause in the crowded court. Dr. Hadwen was accordingly discharged.

Medical News.

In connexion with the forthcoming election of direct representatives to the General Medical Council, a meeting has been arranged by the Birmingham Branch of the British Medical Association to be held at the Medical Institute, 154, Great Charles Street, Birmingham, on Monday, November 10th, at 4.15 p.m., when Dr. J. A. Macdonald and Sir Jenner Verrall will address their prospective constituents. At a meeting convened by the Lancashire and Cheshire Branch to be held at the Brasenose Club, 94, Mosley Street, Manchester, on Tuesday, November 11th, at 4.15 p.m., Dr. R. A. Bolam and Dr. H. B. Brackenbury will speak. The election address of the four British Medical Association candidates was published in the Supplement of last week (p. 161), together with the first list of supporters; a further list of supporters appears in the Supplement this week.

The next Chadwick public lecture will be on "The rat menace—its true significance and how it can be minimized," by Mr. T. Mark Hovell, F.R.C.S., in the Barnes Hall, Royal Society of Medicine, 1, Wimpole Street, on Monday, November 10th, at 8 p.m.

During November a course in venereal diseases will be held at the London School of Dermatology (St. John's Hospital). At St. Mark's Hospital a two weeks' course in proctology will be held from November 10th to 22nd, and at the Chelsea Hospital for Women a course from Friday, November 21st, to December 6th. At the Royal Waterloo Hospital a course in medicine, surgery, gynaecology, and children's diseases will be given from November 24th to December 12th. Syllabuses of the courses may be obtained from the Secretary of the Fellowship of Medicine, at No. 1, Wimpole Street, W.1.

Under the Workmen's Compensation Act a medical board will probably be appointed shortly to undertake the examinations required by the Refractories Industries (Silicosis) Scheme, and in our advertisement columns to-day there appears an announcement about the two whole-time medical officers who will be required. The board will have its centre at Sheffield, and the senior medical officer appointed must have had not less than ten years' practice in the diagnosis of respiratory diseases, with special experience of silicosis. It is intended to imitate as far as possible the South African scheme and provide opportunities for systematic scientific research.

At the quarterly meeting of the Medico-Psychological Association of Great Britain and Ireland, to be held at 11, Chandos Street, W.1, on November 20th, at 2.30 p.m., Dr. G. de M. Rudolf will read a paper entitled "Malarial treatment of general paralysis: some psychological and physical observations."

The new home for nurses of the Royal Northern Hospital, Holloway, was opened by Princess Louise, Duchess of Argyll, on October 30th. The new building, affording accommodation for 58 nurses, is part of a scheme to provide for 120 nurses, with administrative offices, classrooms, and dining rooms.

The post-graduate lecture at the Royal Dental Hospital of London by Mr. D. P. Gabell, announced for November 19th, has been postponed until January 30th, 1925.

The meeting of the Royal Sanitary Institute at 90, Buckingham Palace Road, S.W.1, on Tuesday, November 18th, at 6 p.m., will be devoted to a discussion on the economic value of the healthy infant and the New Zealand welfare work to the State.

At a meeting of the Pathological Section of the Liverpool Medical Institution on October 30th Professor J. M. Beattie read a paper on the carriage of infection by rats, with special reference to foot-and-mouth disease. From the lymphatic glands of an animal not considered by the Ministry of Agriculture to be infected he had obtained a virus which by inoculation caused lesions of the feet and mouth in rats, and was transferable from one rat to another. In the routine examination to protect the community from plague 55 rats out of 279 examined were found to have lesions of the feet and mouth similar to those produced by this virus, and the frequency varied with the outbreaks of foot-and-mouth disease in the city. A map shown demonstrated clearly that these diseased rats were mostly obtained from sewers leading from the abattoirs, farms, and butchers' shops where the disease was known to have occurred. Other rats from the infected areas showed similar lesions, even gelatinous degeneration of the lungs.

Sir George Wills is making a gift of £60,000 to the Bristol General Hospital, of which he is president, for providing an additional nurses' home and a new out-patient and casualty department.

The annual Armistice Dinner of the Belfast University Services Club will be held in Thompson's Restaurant, Belfast, on Tuesday, November 11th, at 7.15 p.m. At 11 a.m. on Armistice Day wreaths in memory of fallen Queen's men will be placed at the Cenotaph, Whitehall, and at the War Memorial in the University grounds.

The Royal Anthropological Institute announces that the Huxley Memorial Lecture will be delivered this year on Tuesday, November 25th, at 8.30 p.m., in the rooms of the Royal Society, Burlington House, Piccadilly, by Professor Réné Verneau, who has chosen as his subject "La Race de Neanderthal et la Race de Grimaldi: leur rôle dans l'Humanité."

A memorial to Italian doctors who fell in the war was unveiled at Florence on November 1st in the presence of the King and Queen of Italy.

The November issue of the *Traveller in France*, an official publication issued by the Office Français du Tourisme (56, Haymarket, S.W.1), gives an account of the mountain passes in the Alps considered as winter health resorts. Brief descriptions are given of Vernet-les-Bains, Corsica, and Grenoble.

The late Sir Frederick Needham, M.D., formerly a Commissioner of the Board of Control, has left estate of the gross value of £29,381, with net personalty £28,905.

The medical school of Pondicherry in French India, which was founded in 1823 and reorganized in 1863, has granted nineteen medical diplomas during the last ten years. The average yearly number of medical students during this period has been 14.5.

We have received a well illustrated pamphlet on open-air schools in New Zealand—published in Christchurch—by I. G. MacInnes, Dr. N. B. Phillipps assisting in its preparation. The measures for dealing with adverse winds are shown, and an account is given of the progress of this movement since 1904. As the author states, "the open-air school is the logical sequel to the Plunket scheme."

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* British Medical Journal *alone unless the contrary be stated.* Authors desiring reprints of their articles published in the British Medical Journal are requested to communicate with the Financial Secretary and Business Manager, 429, Strand, W.C.2, on receipt of proof.

All communications with reference to advertisements as well as orders for copies of the Journal should be addressed to the Financial Secretary and Business Manager, 429, Strand, London, W.C.2. Attention to this request will avoid delay. Communications with reference to editorial business should be addressed to the Editor, British Medical Journal, 429, Strand, W.C.2.

Correspondents who wish notice to be taken of their communications should authenticate them with their names—not necessarily for publication.

Communications intended for the current issue should be posted so as to arrive by the first post on Monday or at latest be received not later than Tuesday morning.

The telephone number of the British Medical Association and British Medical Journal is Gerrard 2630 (Internal Exchange). The telegraphic addresses are:

EDITOR of the British Medical Journal, *Aitiology Westrand, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westrand, London.*

MEDICAL SECRETARY, *Mediocra Westrand, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 4361, Central).

QUERIES AND ANSWERS.

Epileptiform Fits.

"H. C. B." asks for suggestions for the treatment of epileptiform attacks in a little girl aged 5. The attacks sometimes resemble those of grand mal and sometimes those of petit mal; they began at 4 months old. At first and up to a year ago they occurred every two or three weeks, but they are now much more frequent—about every two days. The bromides, borax, belladonna, luminal, dial acetin, and glandular extracts have all been tried, but our correspondent could not satisfy himself that any one of them had any real effect whatever on the fits. Chloral controlled them when as an infant the child was once or twice threatened with status epilepticus. She is backward, but not "mental"; the physical condition is perfect.

Treatment of Asthma.

"J. G. G." asks for suggestions for the treatment of a lady aged 60, who has suffered from asthma for five years. Her present attack has lasted over six months. There is no history of heredity or neurosis, and there is no naso-pharyngeal abnormality. Potassium iodide over prolonged periods, adrenaline, morphine, lobelia, stramonium, and the exclusion of cats, feathers, etc., have all proved failures.

Liquid Paraffin and Cancer.

Dr. S. Watson Smith (Bournemouth) writes: In your issue of November 1st, p. 840, "B. K." asks whether those who see many cases of malignant disease of the alimentary tract suspect the taking of liquid paraffin as a cause. Shortly after liquid paraffin came into more general use, the late Dr. Allan Jamieson of Edinburgh, in a letter to the British Medical Journal, issued a warning and a reminder of the fact that paraffin workers were, on account of their employment, particularly liable to cancer. An enormous amount of paraffin, solid as well as liquid, must be consumed daily in this country, and chiefly by those who are past the age of full development. One cannot easily avoid ordering it when so many preparations and so-called "foods" have paraffin entering into their composition. Even with a guarantee it is impossible to be absolutely certain of purity or of the absence of all impurity. Paraffin used in ointments and pastes seems to harm few skins; if it cannot be tolerated, another vehicle is substituted. It has, however, to be remembered that ointments containing paraffins have only an occasional use for any particular patient and for seldom longer than days or weeks at a time. Taken internally for months or years, as it commonly is nowadays, may make all the difference in risk, and the few who have the misfortune not to tolerate paraffin well may run a greater risk of future malignant trouble. Within the past few years I have seen three cases of a dry form of dermatitis of both hands in motor-car mechanics, apparently caused by handling petrol and lubricants. It is understood that paraffin causes cancer because of impurities in it. If little or no absorption takes place in the intestine, the paraffin being supposed to be inert, such impurities, if they exist, may yet quite easily exert their action anywhere in the body by becoming assimilated. The risk attending the taking of paraffin in any form has for some years prevented my prescribing it except in special cases. If the Imperial Cancer Research Fund could give some guidance or advice in the matter of the internal use of paraffin, I for one should be grateful.

Income Tax.

Partnership Assessment.

"Delta" inquires whether the inspector of taxes is justified in refusing to issue separate notices of assessment to two partners.

*** The answer is "Yes." In 1907 the system of making separate assessments on partners was abolished by statute, and since then the assessment is required to be made in one sum on the firm. At the same time it is the practice—so far as we know, without exception—for the inspector of taxes to give any reasonable assistance he can to the members of the firm in the task of dividing the firm's liability correctly between the partners. If the inspector absolutely refuses to amplify the brief partnership statement he has given, "Delta" might send the statement to us with such further information on the point as he may be able to give.

Change in Appointment.

"H. A. H." was appointed to a lectureship at £750 per annum as from December 12th, 1921, and has been assessed to pay £61 10s. income tax for the period to April 5th, 1922. Is this correct? He was previously assessed in another district at the rate of £800 per annum "for the year 1921, up to November of that year."

*** The sum of £61 10s. is correct, provided that "H. A. H." has had all his personal allowances from the assessment on his previous earnings; we gather from the inspector's letter that this is the case. The only possibility of any adjustment being due to "H. A. H." is that the previous assessment should be for the period April 5th (and not January 1st), 1921, to the date in November as from which his former appointment terminated. "H. A. H." might find it advisable to obtain particulars from the inspector who dealt with that liability setting out exactly how the duty he paid for 1921–22 in that district was calculated.

LETTERS, NOTES, ETC.

Obstinate Nasal Catarrh in an Infant.

Dr. Lucy Naish, lecturer in osteology, University of Sheffield, in reply to "G. E." (October 18th, p. 746), writes that the nasal catarrh is probably kept up by the frequent insertion of cotton-wool soaked in various things into the nose, with a mistaken idea of cleansing it. All such applications should be stopped and sneezing induced. The child will clear the nose by its own efforts, and fresh supplies of the bactericidal mucus will be able to act when the debris of old mucus is removed by the sneezing. To induce sneezing manipulation should be tried first: gentle massage of the forehead, particularly over the distribution area of the supraorbital nerve, with the hand or with hair-brush. Another way is tickling the orifice with dry cotton-wool, taking care not to poke any up the nose. If these manipulations fail sneezing can be induced by gently touching the septum of the nose with a probe covered with a few grains of powdered Castile soap; other substances with the same effect are Hudson's soap, ginger, or pepper. Only a few grains are required for a baby. When the sneeze has occurred the nose should be stroked gently downwards, as if "milking" it.

Rapid Sterilization of Hypodermic Syringe and Needle.

Dr. W. Johnson Smyth (Bournemouth West), who has recently had occasion to note several instances of bad arms, sends the following simple method of sterilizing hypodermic syringes and needles: Place them in an ordinary test tube one-third full of water and heat to boiling point: a disc of cork as big as a sixpence placed in the bottom of the tube will prevent the point of needle from injury.

Cancer in African Natives.

Writing with regard to Dr. Old's letter published on October 11th (p. 689), Dr. Charles F. Harford (London) refers to the suggestion that malignant disease may be due to bad auto-suggestion, and that suggestion and auto-suggestion may be employed in their treatment. Dr. Harford thinks the clue should be followed up and that the leaders in cancer research should widen the scope of their inquiries and make use of the light which may come through modern psychology. He adds: The psychological factor in malignant disease has been considered by many, and in June, 1923, I had some correspondence on this subject with Dr. Archibald Leitch. In a letter which he was good enough to write to me on June 2nd of that year he gave various reasons for doubting the importance of mental stress in connexion with cancer, and in the course of his argument he wrote as follows: "But above all, certain animal species, which do not impress us as having mental processes subject to the influence of emotions, contract malignant disease as commonly as, and in some cases more commonly than, human beings. The tame mouse, as you know, kept in laboratories, well fed, well cared for, and removed from the vicissitudes of life that the wild mouse has to face, develops cancer even more frequently than does the human being. Dogs, cats, horses, and even placid cows develop cancer. Where does the mental stress come in?" Needless to say I have given much thought to this interesting reply, and I have been led to connect this statement about cancer in animals with the knowledge we have about primitive races. The animals referred to are domestic animals, and in particular the tame mouse is "removed from the vicissitudes of life that the wild mouse has to face." This means that the life of liberty with its sporting chances has been exchanged for the enforced confinement of the laboratory. Is there not a close analogy between these and the primitive races, who have too quickly exchanged the habits of generations for the artificial life of a civilization strictly European in pattern? In each case there has been a violent dislocation of instinctive forces with greater liability to interference even with physical processes.

Dental Skiagrams.

Sir John O'Conor (Buenos Aires) writes: As complement to my note published in the British Medical Journal, August 16th (p. 299), I should be obliged if you would allow me to state that I have every hope that within a short period, as confirmatory diagnostic routine, we shall see in every well appointed clinic radiological general examination of the teeth linked with cytological, etc., examination of the blood.

A Surgical Sling.

Dr. J. M. Dewar (Edinburgh) informs us that a patient of his, a partially disabled ex-soldier, has recently patented an adjustment for carrying surgical slings which eliminates strain on the wearer's neck. It is in the form of a waistbelt fitted with adjustable brace straps (each bearing a flat hook), which fit into slides on an ordinary sling. The weight is thus hung from the shoulders and equally distributed. When adjusted it remains firm and there is no discomfort, such as is caused by a slipping knot. The adjustment has been worn for seven months with comfort to the wearer, who formerly suffered pain and inconvenience from pressure on the neck.

A Death Certification Problem.

Dr. H. L. Pearson (Newcastle) writes: I recently attended a young primipara in a premature labour—about the eighth month. She gave birth to a live child, which, however, lived for only fifteen minutes. The features were Mongolian in type, the right forearm was deformed, and there was only one lower limb, arising from the centre of the pelvis. The child resembled a "Punch and Judy" doll mounted on a stick. The most interesting feature was the entire absence of anus or external genitalia. As the child had had a distinct separate existence, a certificate of death had to be supplied, raising the difficult question—how to fill up the form.

Correction.

In the report of the scientific meeting of the Oxford Division published last week at page 815, for "fourteen" (col. 2, fourth line from top) read "four."

Vacancies.

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 40, 41, 44, and 45 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 42 and 43.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 179.